Ephemerides
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THE
Gentleman's Diary,
OR THE
ATHEMATICAL REPOSITORY;
An ALMANACK
For the YEAR of our LORD, 1757.

BEING

he Firſt after BISSEXTILE, or LEAP-YEAR:
ontaining many uſeful and entertaining Particulars, peculiarly adapted to the ingenious Gentlemen engaged in the delightful Study and Practice of the
MATHEMATICKS;

---

he Seventeenth *Almanack* publiſhed of this Kind;
and the Fifth of the NEW STYLE in *England*.

> ——— Quâ causâ argentea Phœbe
> Paſſibus haud æquis graditur; cur ſubdita nulli
> Hactenus Aſtronomo numerorum fræna recuſat:
> Cur remeant Nodi, curque Auges progrediuntur.
> ——— Quantis refluum vaga Cynthia pontum
> Viribus impellit; dum fractis fluctibus ulvam
> Deſerit, ac Nautis ſuſpectas nudat arenas,
> Alternis vicibus ſuprema ad littora pulſans.

LONDON,
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MDCCLVII.

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ALL Perſons who are pleaſed to be CONTRIBUTORS t this DIARY; by anſwering the QUESTIONS, ÆNIGMAS, &c. or by ſending us new ones, or other Subje proper for the WORK; are deſired to ſend them, and their Solutions, along with them, before the firſt Day of *May* 1757, directed f *The Authors of the* GENTLEMAN's DIARY, to be left with Mr. *JOSEPH HOW*, at the *White Horſe* at *Cripplegate*, LONDON: or, with Mr. *THOMAS PEAT*, in *Caſtlegate*, *Nottingham* (Poſt paid.)

To the PUBLICK.

HAVING always more Room in the Kalendar Part of our Diary than we can poſſibly fill up with *good Weather*; we *expect* that an exact Account of all the FAIRS in *England*, as fixed ſince the Regulation of the *Style*, will ſupply that Room better than *bad Weather*; and alſo be of more general Service to *Tradeſmen*, *Dealers*, &c. according to the *Plan* in the KALENDAR this Year; and if this be agreeable, ſhall for the future publiſh them annually, according to the beſt Information we can procure from our Contributors in their reſpective Neighbourhoods, *&c.*

Mr. *Cha. Wildbore's* Anſwer to Mr. *Chr. Gooke's* Queſtion.

AT the Council held at *Nice*, in the Year of CHRIST 325, when the Calendar was ſettled for the obſerving *Eaſter*; the Vernal Equinox fell on the 20th of *March*: And in the Year 1582, *Gregory* XIII, Biſhop of *Rome*, found it happened on the 10th of *March*; and that the Sun was departed Ten whole Days from his former Place in the Year; he therefore took thoſe Ten Days out of the Calendar that Year, and ordered that the 10th of *March* ſhould be reckoned as the 20th. And to prevent the Seaſons from going backward as before, he ordained, that every hundredth Year, which in the *Julian* Form was to be a *Biſſextile*, ſhould be a *common* Year; but becauſe that was too much, every fourth hundred Year wa ſtill to remain *Biſſextile*: From which it is plain, that the *Gregorian* Year conſiſts of 365 Days, 5 Hours, 49′, 12″, which is only 15″ more than the true *Tropical* Year, and will not amount to one Day in leſs than 5760 Years.

But, though the Year is now fixed the ſame as at the *Nicene* Council; it is certain, that from the *Julian* Reformation to that Council, the Year had *anticipated* 2 Days, 20 h. 8′, 30″, and therefore we are ſo much later *now* in our Account, than *at* the *Julian* Reformation.

Nottingham,
Jan. 27, 1756.

JANUARY hath xxxi Days.

ull Moon the 5th
Laſt Quarter the 13th
New Moon the 20th
First Quarter the 27th
} Day at {
45 m. paſt 11 Fore. Ap. T.
42 min. paſt 10 Morn.
7 min. paſt 2 Morn.
7 min. paſt 2 Morn.

M D	☉ Decl. South.	
1	23°	0
6	22	28
11	21	45
16	20	52
21	19	49
26	18	36

			☽ Sets		☽ South	
1	S	Circumciſion, New Year's Day.				
2	B	2 Sunday after Chriſtmas.	4	54	0	2
3	M	The Days are now increaſed, and	5	54	10	49
4	Tu	Nights ſhorten'd a quarter of an hour.	6	46	11	35
5	W	Old Chriſtmas Day.	☽ Riſes		Morn.	
6	Th	Epiph. CHRIST's ✱ app. to Gentiles.	5A	20	0	23
7	F	*Days grow longer and longer every Day.*	6	19	1	9
8	S	**Lucian**, Prieſt and Martyr.	7	21	1	56
9	B	1 Sunday after Epiphany.	8	24	2	42
0	M	Princeſs ELIZ. born. Plow-Monday.	9	31	3	26
1	Tu	Days are now 8 hours and 10 min. long	10	39	4	11
2	W	Old New Years Day.	11	49	4	55
3	Th	Hilary, Biſh. and Conf. *Preſton*, Lanc.	Morn.		5	42
4	F	*A Fair at* **Notting.** *for all ſorts of Cattle.*	1	2	6	32
5	S	*Barſton*, Yorkſhire.	2	14	7	22
6	B	2 Sunday after Epiphany.	3	31	8	18
7	M	*Taviſtock*, Devonſhire.	4	47	9	17
8	Tu	Days increaſed above half an hour.	5	57	10	18
9	W	*Preſton*, Lancaſhire.	6	57	11	21
	Th	Oct. Hil. 1. Ret.	☽ Sets		0A	24
	F	**Agnes**, Rom. V. and Mart. *Briſtol.*	6A	19	1	23
	S	**Vinc.** Span. Deac. Mar. *Shefford*, Bedf	7	40	2	17
	B	3 Sunday after Epiphany.	8	56	3	10
	M	Term begins.	10	9	3	59
	Tu	St. PAUL's Converſion.	11	19	4	46
	W	Days are now 8 hours and 50 min. long.	Morn.		5	31
	Th	Quind. Hil. 2. Ret.	0	27	6	17
	F	Days increaſed one hour.	1	32	7	2
	S	*Grampound*, Cornwall.	2	35	7	48
	B	4 Sun. aft. Ep. K. CHARLES I. Martyr'd	3	36	8	35
	M	at *White-Hall*, 12 min. paſt 1, 1649.	4	32	9	23

☉ Riſes		☉ Sets		♄ Sets		♃ Riſes		♂ Riſes		♀ Riſes		☿ Riſes.		Ch. Faſt.	
8h	4'	3	56'	6A	19	3M	8	7 M	53	4M	53	8 M	5	4'	22''
8	0	4	0	6	0	2	51	7	46	5	4	Sets		6	38
7	54	4	5	5	41	2	33	7	38	5	15	4 A	10	8	43
7	50	4	10	5	23	2	16	7	31	5	25	4	38	10	32
7	43	4	17	5	6	1	59	7	23	5	33	5	7	12	3
7	36	4	25	4	48	1	40	7	14	5	40	5	38	13	15

FEBRUARY hath XXVIII Days.

Full Moon the 4th	Day at	7 in the Morning.
Laſt Quarter the 11th		33 min. paſt 9 at Night.
New Moon the 18th		13 min. paſt 1 Afternoon.
Firſt Quarter the 25th		3 quarters paſt 8 at Night.

M D	☉ Decl. South.	
1	16°	58
6	15	28
11	13	5
16	12	1
21	10	2
26	8	3

M D	W D	Sundays, Holy and Remarkable Days, Length, Incr. Days, Terms, Fairs, &c.	☽ Riſes and Sets	Moon South
1	Tu	Day 9 hours and 10 minutes long.	5 M 21	10 A 1
2	W	Candlemas, or Purif. B. V. Mary.	6 6	10 58
3	Th	Cr. Pu. 3 Ret. **Blaſius**, Biſh. and Mar.	6 45	11 45
4	F	*Graveſend*, Kent. *Plymouth*, Dev. *Bodm.*	☽ Riſes	Morn.
5	S	**Agatha** Sicil. V. and M. *Ridbury*, Kent	6 A 9	0 31
6	B	Septuageſima Sunday.	7 18	1 17
7	M	Days are now 9 hours and 28 minutes,	8 24	2 3
8	T	and Nights 14 hours 32 min. long.	9 32	2 49
9	W	*Namptwich*, Cheſh. *Stamford*, Linc.	10 44	3 34
10	Th	Octab. Purif. 4 Ret.	11 57	4 2
11	F	*Llandyſſel*, Monm. Day 4 h. 46m. long.	Morn.	5 12
12	S	Term Ends.	1 11	6 5
13	B	Sexageſima Sunday. Old Candlemas.	2 24	7
14	M	**Valentine**, Biſh. and M. *Flint*.	3 33	7 57
15	Tu	Days are now increaſed, and conſequent-	4 37	8 58
16	W	ly Nights ſhortened 2 hours 20 min.	5 33	10
17	Th	Day 10 h. 6m. & Nights 13 h. 54 m. long	6 20	11
18	F	*Nun-Eaton*, Warwickſh.	☽ Sets	11 58
19	S	*Beverley*, Yorkſhire.	6 A 26	0 A 52
20	B	Quinq. or Shrove Sunday.	7 43	1 44
21	M	*Norton*, Oxf.	8 57	2 34
22	Tu	Shrove Tueſday.	10 8	3 2
23	W	Aſh Wedneſday.	11 17	4
24	Th	St. MATTHIAS Ap. and M. *Bath*, Som.	Morn.	4 5
25	F	*Feverſham*, Kent. *Caernarvon*. *Matlock*.	⊙ 23	5 4
26	S	*Oundle*, Northampt.	1 26	6 3
27	B	Quadrageſima Sunday, 1 Sun. in Lent.	2 25	7 1
28	M	*Cheſterfield*. Derbyſhire.	3 18	8

M D	☉ Riſes	☉ Sets	♄ Sets	♃ Riſes	♂ Riſes	♀ Riſes	☿ Sets	Cl. faſt
1	7h 26′	4h 35′	4 A 28	1 M 20	7 M 2	5 M 45	6 A 12	14′ 1
6	7 16	4 44	Riſes	1 2	6 53	5 49	6 30	14 4
11	7 8	4 53	6 M 55	0 44	6 44	5 53	6 31	14 4
16	6 59	5 2	6 36	0 27	6 34	5 54	6 7	14 3
21	6 49	5 12	6 19	0 9	6 23	5 52	Riſes	14
26	6 39	5 22	6 0	11 A 46	6 12	5 50	6 M 0	13 1

MARCH hath xxxi Days.

M D	☉ Decl. South	
1	7°	24′
6	5	29
11	3	32
16	1	33
21	0 N.	25
26	2	23

ull Moon the 6th	Day at	a quarter paſt Midnight.
Laſt Quarter the 13th		3 quarters paſt 5 Morn.
ew Moon the 20th		7 min. before 1 Morn.
irſt Quarter the 27th		33 min. paſt 4 Afternoon.

☉ in Aries 19 Days, 21 H, 44 Minutes.

1	Tu	**David** Archb. Minev *Galgarth*, Breck.	4 M	5	8 A	54
2	W	Ember Week. Cedde, or Chad. B. Litc.	4	46	9	42
3	Th	Days are now above 11 hours long	5	21	10	31
4	F	*Melton Mowbray*, Leic. *Darlington*, Dur.	5	52	11	17
5	S	*Blandford*, Dorſetſhire.	6	19	Morn.	
6	B	Reminiſcere, 2 Sunday in Lent.	☽ Riſes		0	3
7	M	**Nottingham** *Fair, for all ſorts of Cattle.*	7 A	28	0	49
8	Tu	Days are now encreaſed 3 hours 38 m.	8	39	1	36
9	W	being now 11 hours & 23 min. long.	9	52	2	24
10	Th	And now are encreaſing apace daily, and	11	6	3	14
11	F	the Nights ſhorten every Night as faſt	Morn.		4	7
12	S	**Greg.** M. B. of R. & C. *Culliford*, Dev.	0	18	5	0
13	B	Oculi, 3 Sunday in Lent.	1	29	5	55
14	M	*Brimblebanks*, Norf. *Sevenoak*, Kent.	2	35	6	55
15	Tu	*Oakham*, Rut. *Oſweſtry*, Shropſh. *Langa*	3	32	7	54
16	W	*Penſance*, Cornw. [*dock.*	4	19	8	52
17	Th	*Hariff*, Hunt. *Malmſbury*, Wilts.	5	0	9	50
18	F	Ed. K. o. W. Sax. *Loughbro'* Leic. *Workſop.*	5	34	10	44
19	S	*Abbot's Bromley*, Staff. *Ruthin*, Denb.	6	3	11	38
20	B	Lætare, 4 S. in Lent. Midlent Sunday.	☽ Sets		0 A	29
21	M	*Downes*, Devon.	7 A	53	1	18
22	Tu	Day 12 hours and near a quarter long.	9	5	2	7
23	W	*Wrexham*, Den. *Wye*, K. *Wooburn*, Bed.	10	13	2	54
24	Th	*Llanerchemith*. Caer. *Shirley St*. Warw.	11	20	3	42
25	F	Annunc. Lady Day. Pr. EDWARD born.	Morn.		4	31
26	S	*Glouceſter*. *Namptwich*, Cheſh. *St. Albans*	0	22	5	19
27	B	Judica, 5 Sunday in Lent.	1	17	6	7
28	M	*Cobham*, Surrey, *Preſton*, Lancaſhire.	2	7	6	56
29	Tu	*Stourbridge*, Worceſterſhire.	2	53	7	43
30	W	Days are increaſed above 5 h. *Drayton*	3	29	8	30
31	Th	*Midhurſt*, Suſſ. *Northmore*, Suſſ. *Durham.*	4	1	9	18

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Riſes	♂ Riſes	♀ Riſes	☿ Riſes	Cl. faſt
1	6h 34′	5h 27	5 M 50	11 A 3	6 M 6	5 M 47	5 M 18	12′ 42′
6	6 24	5 37	5 33	11 17	5 56	5 44	5 34	11 35
11	6 14	5 47	5 16	10 58	5 44	5 38	5 25	10 16
16	6 4	5 57	4 59	10 38	5 34	5 33	5 19	8 50
21	5 54	6 7	4 42	10 19	5 23	5 27	5 14	7 20
26	5 44	6 17	4 25	10 0	5 11	5 19	5 10	5 47

APRIL hath xxx Days.

Full Moon the 4th } Day at { 18 min. paſt 2 Afternoon.
Laſt Quarter the 11th } Day at { a quarter paſt Noon.
New Moon the 18th } Day at { 56 min. paſt Noon.
Firſt Quarter the 26th } Day at { 54 m. paſt 11 Forenoon.

M D	☉ Decl. North.	
1	4°	45′
6	6	37
11	8	29
16	10	17
21	12	1
26	13	29

2	F	All Fools Day, *Coventry*, Warwickſhire.	4	M 29	10	A 4
3	S	*Saliſbury*, Wilts. *Chicheſter*, Suſſ. *Toceſter*.	4	56	10	51
	B	Palm Sunday. 6 Sunday in Lent.	5	20	11	38
4	M	*Northfleet*, Kent. *Perthaethwy*, Angleſea.	☽	Riſes	Morn.	
5	Tu	Old Lady D. *Huntington*. *Doncaſter*.	7	A 46	0	26
6	W	*Epping*, Eſſex. *Rochford*, Eſſex.	9	1	1	17
7	Th	**Notting**. *for all ſorts of Cattle laſts 8 Days*	10	18	2	8
8	F	Good Friday. Days 13 h. 24 m. long.	11	31	3	3
9	S	Days increaſed 5 hours & above an half	Morn.		4	0
10	B	EASTER DAY. Our SAVIOUR's Reſ	0	38	4	58
11	M	Eaſter Monday. *Newport-Pagnel*, Bucks.	1	37	5	56
12	Tu	Eaſter Tueſday. *St. Toſſels*, Cornwall.	2	27	6	54
13	W	*Budworth*, Cheſ. *Aſhbourn*, Derb. *Orleton*.	3	8	7	51
14	Th	Now the Days encreaſe very faſt.	3	43	8	46
15	F	*Bewley*, Hampſhire. *Derby*.	4	13	9	38
16	S	*Dilton's Marſh*, Wilts. *Binbrooke*, Linc.	4	40	10	28
17	B	Low Sunday. 1 Sunday after Eaſter.	5	4	11	17
18	M	*Cobham*, Surry, *Derby*.	☽	Sets	0	A 6
19	Tu	*Caſtle-town*, Dorſetſh. *Winſlow*, Bucks.	8	A 4	0	53
20	W	*Worceſter*. *Cank*, Staff. *Norſe*, Devonſh.	9	12	1	42
21	Th	*Modbury*, Devonſh. *Rumney*, Kent.	10	16	2	30
22	F	*Shrewſbury*. *Giſborough*, Yorkſh.	11	15	3	19
23	S	St. GEORGE. *Biſley*, Glo. *Northampton*.	Morn.		4	8
24	B	2 Sunday after Eaſter.	0	9	4	56
25	M	St. MARK Ev. & M Quind. Paſch. 1 Ret.	0	55	5	43
26	Tu	Prince WILLIAM born.	1	34	6	30
27	W	Term begins. *Boroughbridge*, Yorkſh.	2	8	7	16
28	Th	*Soham*, Cambr. *Aberforth*, Yorkſh.	2	37	8	2
29	F	*Market Harbro'* Leic. *Newchurch*, Lanc.	3	4	8	48
30	S	*Giſborough*, Yorkſhire.	3	29	9	34

N.B. Winter never rots in the Sky. *R. Cooper.*

M D	☉ Riſes		☉ Sets		♄ Riſes		☉ Riſes		♃ Riſes		♂ Riſes		♀ Riſes		Cl. faſt.	
1	5	33	6	28	4 M	5	9 A	36	4 M	57	5 M	11	5 M	5	3	55
6	5	23	6	38	3	47	9	16	4	45	5	3	4	59	2	24
11	5	13	6	48	3	29	8	54	4	33	4	55	4	54	0	58
16	5	4	6	57	3	12	8	32	4	22	4	47	4	49	Slow	19
21	4	54	7	7	2	55	8	11	4	10	4	39	4	43	1	28
26	4	46	7	16	2	37	7	4	3	57	4	30	4	39	2	2

MAY hath xxxi Days.

M D	☉ Decl. North.	
1	15°	13'
6	16	40
11	18	0
16	19	12
21	20	17
26	21	13

Full Moon the 4th	Day at	6 min. paſt 1 Morning.
Laſt Quarter the 10th		9 min. paſt 6 Afternoon.
New Moon the 18th		50 min. paſt 1 Morning.
Firſt Quarter the 26th		a quarter after 5 Morn.

1	B	3 S. aſt, Eaſter. St. Ph. & Jac. Ap. & M.	3M	51	10A	22
2	M	Tres Paſch. 2 Ret. *Totneſs*. [*Wirkſworth*	4	16	11	12
3	Tu	Invent. of the Croſs. *Lancaſter*, *Brecknock*	4	42	Morn.	
4	W	*Ipſwich* Suff. *Cheſterfield*, Derb. *Bewdley*.	☽ Riſes		0	3
5	Th	*Boſton*, Linc. *Monmouth*. *Stockunderham*.	9A	23	0	59
6	F	St. John Evang. ante Port Lat. *Abingdon*.	10	33	1	55
7	S	*Bath*, Som. *Dunmow*, Eſſ. *Leek*, Staff.	11	38	2	55
8	B	4 Sunday after Eaſter	Morn.		3	55
9	M	Menſ. Paſch. 3 Ret. *Boſworth*, Leic.	0	33	4	55
10	Tu	*Higham-Ferrers*, Northamp. *Lutterworth*	1	17	5	53
11	W	*Leiceſter*. *Dunſtable*, Bedf. *Crediton*, Dev.	1	52	6	47
12	Th	Old May Day. *Belper*, Der. *Penryn*, Corn.	2	22	7	39
13	F	*Tiddeſwel*, Derb. *Crouch*, Eſſ. *Bala*, Meri.	2	49	8	28
14	S	*Wells*, Som. *Denbigh*. *Newark*, Notting.	3	13	9	17
15	B	5 Sunday after Eaſt. Rogat. Sunday.	3	37	10	3
16	M	Quind. Paſch, 4 Ret. *Caerwilly* *Caerm*.	4	0	10	51
17	Tu	*Aſhford*, Kent. *Holbeach*, Linc. *Wareham*.	4	26	11	37
18	W	Rogation Week. *Hateſbury*. *Thunderly*.	☽ Sets		0A	25
19	Th	Holy Thurſday, CHRIST's Aſcenſion.	9A	8	1	14
20	F	Craſt. Aſcen. 5 Ret. *Galgarth*. *Wickham*.	10	3	2	3
21	S	*Aſhborn*, Derb. *Cromſtock*, Devon.	10	53	2	52
22	B	Exaudi. 6 Sunday after Eaſter.	11	36	3	40
23	M	Term ends. *Dorcheſter*, *Bala*, *Merion*.	Morn.		4	26
24	Tu	P. Frederick William born *Bath*.	0	11	5	12
25	W	*Abberford*, *Dagenham*, Eſſ. *Malmſbury*.	0	42	5	58
26	Th	Aug. 1ſt Archb. Cant. *Perthaethwy*, Angl.	1	9	6	43
27	F	Venerable Bede, Pr. *Stortford*, Hertford.	1	33	7	27
28	S	*Bala*, Merioneth. *Hadſtock*, Devonſh.	1	55	8	13
29	B	Whit. Sund. K. Char. II. Nat. and Ret	2	18	9	1
30	M	Whit. Monday. *Southwell*, Nott.	2	41	9	51
31	Tu	Whit. Tueſday. *Newark upon Trent*.	3	8	10	43

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Riſes	♀ Sets	☿ Riſ.	Cl. ſlow.
1	4^h 36	7 23	2M 19	7A 26	3M 45	4A 22	4M 35	3' 10''
6	4 28	7 33	2 1	Sets	3 32	4 14	Sets	3 42
11	4 20	7 41	1 42	4M 20	3 19	4 7	8A 59	3 59
16	4 12	7 48	1 23	4 0	3 6	4 1	9 35	4 2
21	4 5	7 55	1 3	3 38	2 53	3 55	10 0	3 50
26	3 59	8 1	0 43	3 16	2 39	3 50	10 50	3 25

JUNE hath xxx Days.

M D	☉ Decl. North
1	22° 8'
6	22 43
11	23 10
16	23 24
21	23 29
26	23 24

Full Moon the 2d	Day at	half paſt 9 in the Morn.
Laſt Quarter the 9th	Day at	half before 1 Morning.
New Moon the 16th	Day at	40 min. paſt 3 Afternoon.
Firſt Quarter the 24th	Day at	39 min. paſt 7 at Night

☉ in Cancer 20 Day, 20 h. 44 minutes.

1	W	Ember Week. *Lenton*, Nott. *Ruthin*, D.	3 M 38	11 A 39
2	Th	*Bingham*, Nott. *Daventry*, Northamp.	☽ Riſes	Morn.
3	F	*Harſley-Green*, Lanc. *Kerby-Steph* Weſt.	9 A 24	0 39
4	S	Pr. of WALES bo. 1738. *St. Toſſels*, Cor.	10 24	1 42
5	B	Trinity Sunday.	11 14	2 43
6	M	Craſt. Trin. 1 Ret. *Lenham*, Kent.	11 54	3 43
7	Tu	*Montgomery*. *Stow in Guillam*, Suff.	Morn.	4 40
8	W	*St. Germains*, Cornwall.	0 26	5 34
9	Th	*Hadderſfield*, Suſſex. Corpus Chriſti.	0 53	6 24
10	F	Term begins. Prs. AMELIA bo. 1711.	1 16	7 12
11	S	St. Barnabas Ap. & M.	1 40	8 0
12	B	1 Sunday after Trinity.	2 3	8 46
13	M	Oct. Trin. 2 Ret. *Kedderminſter*, Wor.	2 27	9 31
14	Tu	*Bangor*, Cornwall.	2 54	10 18
15	W	*Ryſton*, Somerſetſhire.	3 23	11 5
16	Th	*Wrexham*, Denb. *Milborn Port*, Som.	☽ Sets	11 53
17	F	*S. Alban*, Bedf. *Taunton*, So. *Bradford*, W.	8 A 45	0 A 42
18	S	*Ingleton*, Yorkſh. *Wiggan*, Lanc.	9 30	1 30
19	B	2 Sunday after Trinity.	10 8	2 18
20	M	Quind. Trin. 3 Ret. *Derby*, *Hereford*.	10 40	3 4
21	Tu	*Highbeach*, Eſſ. *Newborough*, Lanc.	11 8	3 49
22	W	K. GEO. II. Inaug. *Boroughbridge*, Yo.	11 32	4 34
23	Th	*Armington*, Dev. *Folkingham*, Linc. Faſt.	11 54	5 17
24	F	Nativ. of St. JOHN Bap. *Barnwell*, Cam.	Morn.	6 1
25	S	Days will now grow ſhorter every Day.	0 16	6 46
26	B	3 S. after Trinity. K. GEORGE II. Pro.	0 40	7 33
27	M	Tres Trin. 4 Ret.	1 2	8 22
28	Tu	*Emlin*, Worc. *Fairford*, Glouceſt. Faſt	1 30	9 16
29	W	St. Peter Ap. & M. Term ends.	2 2	10 13
30	Th	*Bridgenorth*, Shropſhire.	2 43	11 14

M D	☉ Riſe	☉ Sets	♄ Riſes	♃ Sets	♂ Riſes	♀ Riſes	☿ Sets	Cl. ſlow
1	3h 53	8h 7	0 M 19	2 M 51	2 M 23	3 M 46	10 A 11	2' 41
6	3 49	8 11	11 A 54	2 29	2 9	3 45	9 59	1 52
11	3 46	8 14	11 33	2 8	1 56	Sets	9 37	0 5[illegible]
16	3 44	8 16	11 12	1 46	1 43	8 A 30	9 8	Faſt. 7
	3 4[illegible]	8 17	10 52	1 24	1 30	8 36	8 33	1 10
	3 44	8 16	10 31	1 4	1 18	8 41	7 5[illegible]	2 1[illegible]

JULY hath XXXI Days.

Full Moon the 1ſt	Day at	37 min. paſt 4 Afternoon
Laſt Quarter the 8th		half paſt 8 Morn.
New Moon the 16th		37 min. paſt 6 Morning.
Firſt Quarter the 24th		10 min. paſt 7 Morning.
Full Moon the 30th		36 min. after 11 at Night.

M D	☉ Decl. North.	
1	23°	8′
6	22	42
11	22	7
16	21	30
21	20	27
26	19	25

1	F	*Workſop*, Nott. *Hith*, K. *Thornby Ab*. Ely.	3 M 34	Morn.
2	S	Viſit of the B. V. M. *Hereford*. *Brecknock*	☽ Riſes	0 1
3	B	4 Sunday after Trinity.	9 A 44	1 21
4	M	*Lancaſter*. *Cheſterfield*, Der. *Torrington* D.	10 20	2 22
5	Tu	Old Midſ. Day. *Aſhborne*. Derb. *Leiceſter*.	10 50	3 19
6	W	*Penryn*, Cornw. *Lancaſter*. *Liverpool*.	11 16	4 13
7	Th	**Tho. a Becket.** *Chipping-Norton*, Oxf.	11 41	5 4
8	F	*Folkeſtone*, Kent. *Machynleth*, Montg.	Morn.	5 53
9	S	*Bromley*, Devonſh.	0 4	6 39
10	B	5 Sunday after Trinity.	0 27	7 24
11	M	*Peterborough*, Northamptonſhire.	0 53	8 11
12	Tu	*Canterbury*, Kent. *Carſhalton*, Surry.	1 21	8 57
13	W	*Congleton*, Cheſh. *Huntingdon*.	1 55	9 45
14	Th	Days ſhorten every Day.	2 33	10 34
15	F	**Swithun**, B. of Wincheſt.	3 21	11 21
16	S	*Matlock*, Derb. *Wincheſter*. *Polſtead*, Suff.	☽ Sets	0 A 9
17	B	6 Sunday after Trinity.	8 A 39	0 56
18	M	Days are now 16 h. Nights 8 h. long.	9 7	1 42
19	Tu	*Kenninghall*, Norfolk.	9 33	2 27
20	W	**Marg.** V. & M. *Helſtone*, Cornwall.	9 57	3 11
21	Th	*Fotheringhay* (W. Smith) *Alfreton*, Derb.	10 19	3 55
22	F	S. **Mary Magdalen**. Prs. CAR. MAT. born.	10 41	4 39
23	S	*Honiton*, Devon. *Daventry*.	11 2	5 24
24	B	7 Sunday after Trinity.	11 27	6 11
25	M	St. JAMES Ap. & M.	11 56	7 1
26	Tu	*Briſtol*. *Bedwin*. *Derby*. *Tamworth*.	Morn.	7 56
27	W	*Headon*, Yorkſh. *Portſdown*, Hants.	0 31	8 54
28	Th	*Emlin*, Worceſt. *Fairford*, Glouceſt.	1 16	9 55
29	F	Days are now but 15 hours and half long	2 11	10 5
30	S	*Caerleon*, Monm. *Linton*, Camb.	☽ Riſes	12 0
31	B	8 Sunday after Trinity. Dog Days beg.	8 A 13	Morn.

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Riſe	♀ Sets	☿ Riſes	Cl. faſt.
1	3h 46′	8 14	10 A 9	0 M 43	1 M 6	8 A 44	3 M 51	3′ 15
6	3 49	8 11	9 49	0 23	0 55	8 45	3 23	4 9
11	3 53	8 7	9 27	0 2	0 43	8 44	2 57	4 54
16	3 58	8 2	9 7	11 A 37	0 33	8 41	2 39	5 28
21	4 4	7 56	8 47	11 17	0 23	8 38	2 32	5 50
26	4 11	7 49	8 25	10 58	0 14	8 33	2 35	5 [illegible]

AUGUST hath xxxi Days.

Laſt Quarter the 6th	Day at	16 min. paſt 7 Afternoon.
New Moon the 14th		20 m. after 10 at Night.
Firſt Quarter the 22d		18 min. paſt 4 Afternoon.
Full Moon the 29th		23 min. paſt 7 Morn.

M D	☉ Decl. North.	
1	18°	0′
6	16	39
11	15	13
16	13	40
21	12	2
26	10	20

1	M	Lamas Day.	8 A	47	1 M	1
2	Tu	*Wincheſter*, Hampſh. *Northwich*, Cheſh.	9	16	1	5
3	W	*Carnarvon. Daventry, Redruth.*	9	42	2	51
4	Th	*Epſom*, Surry. *Ravenglaſs*, Cumb. *Thirſk.*	10	6	3	4
5	F	*Doncaſter*, York. *Stamford*, Old St. JA.	10	30	4	3
6	S	Transfig. of our Lord. *Paddington*, Mid.	10	56	5	1
7	B	9 Sunday after Trinity.	11	23	6	7
8	M	Days are now ſhortened 1 hour 36 m.	11	56	6	55
9	Tu	*Llanwrſt*, Denb. *Skirkin*, Middleſex.	Morn.		7	42
10	W	S. Laur. *Flint. Rugby*, Warw. *Thaxted* Eſſ.	0	32	8	31
11	Th	Princeſs AUGUSTA b. 1737 *Allchurch.*	1	15	9	19
12	F	*Newcaſtle*, upon Tyne. *Dunſtable*, Old	2	5	10	7
13	S	*Northampton. Stow*, Suffolk. [Lamas.	3	0	10	54
14	B	10 Sunday after Trinity.	☽ Sets		11	40
15	M	Days are now 14 hours 34 min. long.	7 A	40	0 A	27
16	Tu	*Aſhburn*, Derb. *Donnington*, Linc.	8	4	1	12
17	W	*Bardney*, Hampſhire.	8	26	1	56
18	Th	Now the Days are decreaſed 2 h. 10 m.	8	48	2	39
19	F	*Dartington*, Devonſhire.	9	10	3	24
20	S	Days 14 hours 16 minutes long.	9	33	4	10
21	B	11 Sunday after Trinity.	10	1	4	58
22	M	*Arundel. Doncaſter. Horncaſtle*, (the 21 ſt.)	10	33	5	51
23	Tu	*Belford*, Northum. *Dinton*, Oxf. Faſt.	11	12	6	45
24	W	St. BARTHOLOMEW, Ap. & M.	Morn.		7	43
25	Th	*Milverton*, Somerſetſhire.	0	1	8	43
26	F	*Carliſle*, Cumb. *Huntingdon.*	1	2	9	45
27	S	*Coventry*, Warw. *Giſborough*, Yorkſh.	2	13	10	47
28	B	12 Sunday after Trinity.	3	28	11	46
29	M	Days decreaſed 2 hours 52 minutes.	☽ Riſes		Morn.	
30	Tu	*Barnham*, Suffolk, *for Sheep and Lambs.*	7 A	47	0	42
31	W	Day 13 hours 34 min. long.	8	13	1	3

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Riſes	♀ Sets	☿ Riſes	Cl. faſt
1	4 20	7 40	8 A 1	10 A 35	0 M 3	8 A 25	2 M 58	5 47″
6	4 27	7 32	7 42	10 17	11 A 55	8 16	3 29	5 21
11	4 35	7 24	Sets	10 0	11 49	8 8	4 8	4 41
16	4 44	7 15	4 M 18	9 42	11 43	8 0	Sets	3 48
21	4 53	7 6	3 56	9 24	11 37	7 51	7 A 30	2 41
26	5 2	6 57	3 36	9 7	11 32	7 42	7 26	1 22

SEPTEMBER hath xxx Days.

Laſt Quarter the 5th	Day at	27 min. paſt 9 Morn.
New Moon the 13th		58 min. after 1 Aftern.
Firſt Quarter the 20th		59 min. paſt 11 at Night.
Full Moon the 27th		46 min. paſt 4 Aftern.

⊙ in Libra 22 Day, 10 h. 15 min.

M D	⊙ Decl North.
1	8° 11′
6	6 20
11	4 26
16	2 31
21	0 34
26	1 S 23

1	Th	Giles, Abbot & Conf. *North-moor*, Wilts	8 A 37	2 M 28
2	F	*Richmond Rood*, North.	9 3	3 17
3	S	*Brecknock, and five following Days.*	9 30	4 6
4	B	13 Sunday after Trinity.	10 2	4 55
5	M	Days are now decreaſed 3 h. 18 min.	10 37	5 45
6	Tu	*Folkingham*, Linc. *Snaith*, Yorkſh.	11 19	6 33
7	W	Enurchus, B. of Orleans.	Morn.	7 22
8	Th	Nativ. of the B. V. M. *Wirkſworth*, Derb.	0 8	8 11
9	F	Dog Days end. *Biſhops-Caſtle*, Shropſh.	1 0	8 59
10	S	Days 12 hours 56 min. long.	1 59	9 46
11	B	14 Sunday after Trinity.	3 0	10 32
12	M	Days decreaſed 3 hours and 3 quarters	4 5	11 17
13	Tu	*Newton*, Lanc. *Tregony*, Cornw.	☽ Sets	0 A 2
14	W	Holy Croſs. *Barſly*, K. *Woburn*, Bedf.	7 A 2	0 46
15	Th	Days 12 hours 36 minutes long.	7 24	1 32
16	F	*Lutterworth*, Leic. *Newcaſtle*, Staff.	7 47	2 18
17	S	Lambert, Biſh. & M. *Probus*, Cornw.	8 13	3 5
18	B	15 Sunday after Trinity.	8 43	3 56
19	M	*Drayton*, Shropſhire. Rich. Abbot.	9 19	4 49
20	Tu	*Giſborough*, York. *Mancheſter*, Lanc.	10 3	5 45
21	W	Ember Week. St. MATT. Ap. & Ev.	10 58	6 43
22	Th	*Allchurch*, Worceſt.	Morn.	7 41
23	F	*Halkin*, Wilts. *Paincaſtle*, Radnor.	0 3	8 40
24	S	*Ledwyn*, Glam. *Wickware*, Glouc.	1 17	9 40
25	B	16 Sunday after Trinity.	2 36	10 35
26	M	*Bakewell* and *Cheſterfield*, Derb.	3 57	11 29
27	Tu	*Clapham*, Yorkſh. *Northall*, Middleſex.	☽ Riſes	Morn
28	W	*Glouceſter*. *Tuxford*, Nottinghamſh.	6 A 45	0 22
29	Th	St. MICHAEL and all Angels.	7 11	1 14
30	F	S Jer. Pr. Conf. & Doct. *Wrexham*, Denb.	7 38	2 4

M.D.	⊙ Riſes	⊙ Sets	♄ Sets	♃ Sets	♂ Sets	♀ Sets	☿ Riſes	Cl. ſlow.
1	5h 11	6h 43	3 M 12	8 A 46	11 A 27	7 A 31	7 A 16	0′ 24″
6	5 23	6 36	2 53	8 30	11 23	7 23	7 7	2 1
11	5 33	6 26	2 32	8 13	11 19	7 13	6 58	3 40
16	5 43	6 16	2 13	7 58	11 16	7 5	6 47	5 27
21	5 53	6 6	1 53	7 42	11 13	6 56	6 37	7 10
26	6 2	5 56	1 34	7 25	11 10	6 40	6 2[illegible]	8 53

OCTOBER hath XXXI Days.

M D	☉ Decl. South	
1	3°	20'
6	5	17
11	7	11
16	9	3
21	10	52
26	12	37

Laſt Quarter the 5th } Day at { 22 min. paſt 3 Morn.
New Moon the 13th } Day at { 41 min. paſt 4 Morn.
Firſt Quarter 20th } Day at { 9 min. paſt 7 Morn.
Full Moon the 27th } Day at { 17 min. paſt 4 Morn.

1	S	Remig. B. of Rhemes. *Sheffnal*, Shrop.	8 A 8	2 M 55
2	B	17 Sunday after Trinity. [&c. 8 *Days*	8 42	3 45
3	M	**Nottingham**, *for Cattle, Cheeſe, Hops,*	9 22	4 34
4	Tu	*Penkridge*, Staffordſhire.	10 8	5 24
5	W	*Abberford. Lamport*, Som. *Llanvilling.*	10 59	6 13
6	Th	Faith, Virgin and Mart. *Hull*, Yorkſh.	11 57	7 1
7	F	*Billericay*, Eſſex. *Counteſs Court*, Wilts,	Morn.	7 49
8	S	*Abingdon*, Berks. *Challock*, Kent.	0 57	8 36
9	B	18 Sunday after Trinity.	2 1	9 21
10	M	Old Mich. D. St. *Albans, Bedal, Leiceſter.*	3 6	10 5
11	Tu	Days are now 10 hours 54 min. long.	4 15	10 51
12	W	*Banbury*, Oxf. *Caſtor*, Linc. *Se'noaks*, K.	5 24	11 36
13	Th	Tranſl. of K. Ed. Conf. *Devizes*, Wilts.	☽ Sets	0 A 22
14	F	*Buttonmoor*, Shrop. *Workſop*, Notting.	6 A 24	1 10
15	S	*Falſely*, Warwickſhire.	6 51	2 0
16	B	19 Sunday after Trinity.	7 26	2 52
17	M	*Boſworth*, Leic. *Hay*, Brecknockſh.	8 9	3 48
18	Tu	St. LUKE the Evang. *Cank*, Staff.	9 0	4 46
19	W	*Abberford. Yarm*, Yorkſh. *Oxford.*	10 0	5 45
20	Th	*Aſhborn*, Derb. *Blythe*, Nott. *Hereford.*	11 10	6 42
21	F	*Gainſborough*, Linc. *Downes*, Cornw.	Morn.	7 40
22	S	K. GEO. II. crowned 1727. *Wells*, Som.	0 26	8 35
23	B	20 Sunday after Trinity.	1 45	9 28
24	M	*Drayton*, Shropſhire. (Rich. Abbot.)	3 6	10 18
25	Tu	**Criſpin** Mart. *Queens Camel*, Som.	4 23	11 9
26	W	*Grantham*, Linc. *Chepſtow*, Monm.	5 38	11 59
27	Th	*Appletreewick*, Yorkſh. Faſt.	☽ Riſes	Morn.
28	F	St. SIMON & JUDE, A. & M. *Buckingh.*	6 A 10	0 49
29	S	*Newcaſtle upon Tyne*,	6 42	1 39
30	B	21 Sunday after Trinity. [*age*, &c.	7 20	2 29
31	M	*Belper*, Derb. *with neither Toll. Pack-*	8 3	3 18

M D	☉ Riſes	☉ Sets	♄ Sets	♃ Sets	♂ Riſes	♀ Sets	☿ Sets	Cl. ſlow.
1	6h 12'	5h 47	1 M 16	7 A 9	11 A 6	6 A 41	6 A 12	10' 30"
6	6 22	5 37	0 57	6 53	11 3	6 34	5 57	12 0
11	6 32	5 27	0 38	6 38	10 59	6 29	5 42	13 20
16	6 42	5 17	0 18	6 21	10 54	6 24	5 22	14 28
21	6 51	5 8	11 A 56	6 5	10 49	6 2[illegible]	Riſes	15 21
26	7 1	4 58	11 37	5 49	10 42	6 1[illegible]	1 M 1[illegible]	15 56

NOVEMBER hath xxx Days.

Laſt Quarter the 3d	Day at	53 min. paſt 11at Night.
New Moonthe 11th		10 after 6 at Night.
Firſt Quarter the 18th		33 after 2 Afternoon.
Full Moonthe 25th		25 paſt 6 at Night.

M D	☉ Decl. South.	
1	14°	36
6	16	9
11	17	30
16	18	53
21	20	4
26	21	4

1	Tu	All Saints Day.	8 A	52	4 M	9
2	W	Princeſs of Orange bo. 1709. All Soul .	9	47	4	59
3	Th	On the Morrow of all Souls. 1 Ret.	10	47	5	46
4	F	*Appleſhaw*, Hants.	11	50	6	34
5	S	Papiſts Conſpiracy. *Beverley*, York.	Morn.		7	20
6	B	22 Sunday after Trinity. [Term beg.	0	54	8	4
7	M	Prince HENRY FRED. born 1745.	1	59	8	47
8	Tu	*Hexham*, Northum. *Colcheſter*, *Hertford*.	3	7	9	31
9	W	*Bingham*, Not. (*now returned to the O.S.*)	4	17	10	17
10	Th	K. GEO. II. bo. 1683 *Darlington*, Durh.	5	29	11	4
11	F	St. **Martin**, Biſh. & Conf. *Liverpool*.	☽ Sets		11	53
12	S	On the Morrow of Saint Martin. 2 Ret.	5 A	26	0 A	46
13	B	23 Sunday after Trinity.	6	5	1	42
14	M	*Brecknock, and five Days following.*	6	53	2	40
15	Tu	Machutus, Biſh.	7	52	3	39
16	W	*Andover*, Hampſh. *Launceſton*, Cornw.	9	1	4	38
17	Th	Hugh, Biſh. of Linc. *Sheffield*, Yorkſh.	10	14	5	35
18	F	In eight Days of Saint Martin. 3 Ret.	11	30	6	29
19	S	*Woodcot*, Oxf. *Yarme*, Yorkſh.	Morn.		7	22
20	B	24 Sunday after Trinity.	0	47	8	12
21	M	*Garſtang*, L. *Lamport*, Som. *Lodden*, Norf.	2	5	9	2
22	Tu	*Darlington*, Dur. *Dover*. *Monmouth*. *York*.	3	20	9	50
23	W	S. Clem. 1. B. of R. *Hide*, Eſſex.	4	34	10	38
24	Th	Day 8 hours 28 min. long.	5	47	11	26
25	F	Prince WILL. HENRY bo. 1734 4 Ret.	☽ Riſes		Morn.	
26	S	*Cheſterfield*, Derb. the 25th	5 A	10	0	16
27	B	Advent Sunday.	5	50	1	5
28	M	*Glouceſter*. *Lincoln*. *Northampton*.	6	37	1	55
29	Tu	Term ends. *Aſhbourn*, Derb.	7	30	2	44
30	W	Her Royal High. the Prs. of WALES bo. [1719.	8	27	3	33

M D	☉ Riſes		☉ Sets		♄ Sets		♃ Sets		♂ Riſes		♀ Sets.		☿ Riſes		Cl. ſlow.	
1	7h	12′	4h	47	11 A	15	5 A	29	10 A	35	6 A	18	5 M	29	16′	14
6	7	21	4	38	10	56	5	12	10	26	6	19	5	24	16	7
11	7	29	4	30	10	37	4	55	10	18	6	23	5	36	15	40
16	7	37	4	22	10	18	4	38	10	8	6	30	5	57	14	42
21	7	45	4	15	9	58	Riſes		9	52	6	36	6	20	13	42
26	7	51	4	9	9	38	7 M	27	9	45	6	44	6	45	12	13

DECEMBER hath XXXI Days.

Laſt Quarter the 3d } Day at { 6 min. paſt 9 at Night.
New Moon the 11th } Day at { 27 after 6 in the Morn.
Firſt Quarter the 17th } Day at { 7 min. paſt 11 at Night.
Full Moon the 25th } Day at { 21 min. paſt 11 Forenoon.

☉ in Capricorn 21 Day 1 hour, 48 minutes.

M D	☉ Decl. South.	
1	21°	55′
6	22	36
11	23	5
16	23	23
21	23	29
26	23	27

1	Th	*Dutton*, Dev *Heath*. Su. *Rotherham*, Yor.	9 A	28	4 M	20
2	F	*Hoxne*, Suffolk.	10	30	5	7
3	S	*Pennyfont*, Somerſetſhire.	11	35	5	51
4	B	2 Sunday in Advent.	Morn.		6	33
5	M	*Colford*, Glouc.	0	41	7	16
6	Tu	Nicol. B. *Launceſton*, Corn. *Ludlow*, Shr.	1	48	8	0
7	W	Days decreaſed 8 hours 34 min.	2	57	8	45
8	Th	*Wells*, Som. *Boſton*, Linc. *Malpas*, Ch.	4	11	9	32
9	F	*Bradford*, Wilts.	5	24	10	23
10	S	*Newport*, Shropſh. *Swindon*, Wilts.	6	39	11	17
11	B	3 Sunday in Advent.	☽ Sets		0 A	15
12	M	*Shrewſbury*, Shrop. *Roſs*, Her. *Bedal*. Yo.	5 A	27	1	16
13	Tu	Lucy, Virgin & Mart. *Ameſbury*, J. D.	6	35	2	18
14	W	Ember Week.	7	49	3	17
15	Th	*Atherſtone*, Warw. *Namptwich*, Cheſh.	9	6	4	14
16	F	O Sapientia.	10	26	5	9
17	S	*Exeter*, Devon. *Grantham*, Linc.	11	43	6	0
18	B	4 Sunday in Advent.	Morn.		6	49
19	M	The ſhorteſt Day at LOND. is 7 h. 35 m.	0	57	7	35
20	Tu	at NOTTINGH. 7 hours 18 min.	2	11	8	23
21	W	St. THOMAS Ap. & M.	3	22	9	10
22	Th	*Newport Keams*, Montg.	4	33	9	58
23	F	Greateſt dec. of Day at LOND. 8h. 50m	5	41	10	46
24	S	at NOTT. 9 hours 25 min.	6	45	11	37
25	B	CHRISTMAS-DAY.	☽ Riſes		Morn.	
26	M	St. STEPHEN, 1ſt Martyr.	5 A	7	0	25
27	Tu	St. JOHN Ap. and Evang.	6	3	1	15
28	W	Innocents Day.	7	1	2	2
29	Th	*Lockhill*, Som.	8	4	2	47
30	F	*Maiden Bradley*, Wilts.	9	8	3	33
31	S	Silveſter Biſh. of Rome.	10	13	4	15

M D	☉ Riſes		☉ Set		♄ Sets		♃ Riſes		♂ Riſes		♀ Sets		☿ Riſes		Cl. ſlow.	
1	7ʰ	57′	4ʰ	3	9 A	19	7 M	11	9 A	29	6 A	55	7 M	10	10	25″
6	8	1	3	59	8	59	6	55	9	13	7	6	7	33	8	21
11	8	5	3	55	8	40	6	40	8	56	7	19	7	57	6	6
16	8	7	3	53	8	20	6	24	8	37	7	31	Sets		3	42
21	8	8	3	52	8	1	6	7	8	15	7	42	3 A	52	1	11
26	8	7	3	53	7	41	5	50	7	52	7	54	4	6	1 Faſt	20

A TABLE of all the KINGS and QUEENS of *England* ſince the Conqueſt.

The Year of the Birth of each King and Queen; alſo the Year, Month, and Day, whereon they began to reign: beginning the Year the firſt Day of January, 1757.					The Length of each Reign.			The Years expired ſince each Reign began and ended.	
Names.	Born.	Began to Reign.			Y.	M.	D.	Beg	End
William Conq.	1027	1066	October	14	20	10	26	690	669
William Rufus	1057	1087	Septem.	9	12	10	24	669	656
Henry I.	1058	1100	Auguſt	2	35	4	0	656	621
Stephen	1105	1135	Decem.	1	18	10	24	621	602
Henry II.	1134	1154	October	25	34	8	11	602	567
Richard I.	1156	1189	July	6	9	9	0	567	557
John	1166	1199	April	6	17	6	13	557	540
Henry III.	1207	1216	October	19	56	1	0	540	484
Edward I.	1239	1272	Novem.	16	34	7	21	484	449
Edward II.	1284	1307	July	7	19	6	13	449	429
Edward III.	1312	1327	January	20	50	5	1	429	379
Richard II.	1366	1377	June	21	22	3	8	379	357
Henry IV.	1367	1399	Septem.	29	13	5	21	357	343
Henry V.	1389	1413	March	20	9	5	11	343	333
Henry VI.	1421	1422	Auguſt	31	38	6	4	334	294
Edward IV.	1442	1461	March	4	22	1	5	295	273
Edward V.	1471	1483	April	9	0	2	13	273	273
Richard III.	1443	1483	June	22	2	2	0	273	271
Henry VII.	1457	1485	Auguſt	22	23	8	0	261	247
Henry VIII.	1492	1509	April	22	37	9	6	247	209
Edward VI.	1537	1547	January	28	6	5	8	209	209
Mary I.	1516	1553	July	6	5	4	11	203	198
Elizabeth	1533	1558	Novem.	17	44	4	7	198	153
James I.	1566	1603	March	24	22	0	3	153	131
Charles I.	1600	1625	March	27	23	10	3	131	107
Charles II.	1630	1649	January	30	36	0	7	107	71
James II.	1633	1685	February	6	4	0	7	71	67
William III	1662	1689	Feb.	13	5	10	15	67	62
Mary II.	1650				13	0	23	67	54
Anne	1665	1702	March	8	12	4	24	54	42
George I.	1660	1714	Auguſt	1	12	10	10	42	29
George II.	1683	1727	June	11	whom God preſerve.				

A Compendious TABLE of INTEREST,

Shewing the Intereſt of any Sum of Money, from a Million to a Pound; for any Number of Days, at any Rate of Intereſt.

N°.	l.	s.	d.	q.		N°.	l.	s.	d.	q.	
1000000—	2739	14	6	0	,99	1000—	2	14	9	2	,14
900000—	2465	15	0	3	,29	900—	2	9	3	3	,12
800000—	2191	15	7	1	,59	800—	2	3	10	0	,11
700000—	1917	16	1	3	,89	700—	1	18	4	1	,10
600000—	1643	16	8	2	,19	600—	1	12	10	2	,80
500000—	1369	17	3	0	,49	500—	1	7	5	3	,70
400000—	1095	17	9	2	,79	400—	1	1	11	0	,50
300000—	821	18	4	1	,09	300—	0	16	5	1	,40
200000—	547	18	10	3	,40	200—	0	10	11	2	,30
100000—	273	19	5	1	,70	100—	0	5	5	3	,01
90000—	246	11	6	0	,32	90—	0	4	11	0	,71
80000—	219	3	6	0	,96	80—	0	4	4	2	,41
70000—	191	15	7	1	,59	70—	0	3	10	0	,11
60000—	164	7	8	0	,22	60—	0	3	3	1	,81
50000—	136	19	8	2	,85	50—	0	2	8	3	,51
40000—	109	11	9	1	,48	40—	0	2	2	1	,21
30000—	84	3	10	0	,11	30—	0	1	7	0	,90
20000—	54	15	10	2	,74	20—	0	1	1	0	,60
10000—	27	7	11	1	,37	10—	0	0	6	2	,30
9000—	24	13	1	3	,23	9—	0	0	5	3	,67
8000—	21	18	4	1	,10	8—	0	0	5	1	,40
7000—	19	3	6	2	,96	7—	0	0	4	2	,41
6000—	16	8	9	0	,82	6—	0	0	3	3	,76
5000—	13	13	11	2	,58	5—	0	0	3	1	,15
4000—	10	19	2	0	,55	4—	0	0	2	2	,52
3000—	8	4	4	2	,41	3—	0	0	1	3	,80
2000—	5	9	7	0	,27	2—	0	0	1	1	,26
1000—	2	14	9	2	.14	1—	0	0	0	2	,63

RULE.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two laſt Figures to the Right Hand, and the reſt you muſt find in the Table.

Example, What is the Intereſt of 100 l. for 365 Days at 5 per Cent.

N°. of Days 365
multiply by 100
Product 36500
multiply by 5 Rate p. Cent.
1825100

Then in the Table
againſt 1000 is 2 14 9 2 ,14
800 2 3 10 0 ,11
20 0 1 1 0 ,60
5 0 0 3 1 ,15
Anſw. 5 0 00 ,00

To our ingenious and worthy CONTRIBUTORS.

GENTLEMEN, &c.

IN our two laſt DIARIES, for the Years 1755 and 1756, We deſired all our CONTRIBUTORS to be ſo honeſt as to ſend *us* their *own* Performances, *&c.* And further *(Gentlemen)* we did, in 1756, aſſure *you*, that whoever ſhould, for the future, be found guilty of ſuch Practices, we would not fail to expoſe *them* to the *World:* accordingly (though with great Reluctance) we now publiſh the following Obſervation of Mr. *Samuel Bamfield's*, of *Honiton* in *Devonſhire*, *verbatim*, viz.

The 4th ÆNIGMA, pretended by *Timothy Drury* to be his *own*, is entirely taken from the ingenious and Rev. Mr. *John Pomfret's Poems*; for, Mr. *Drury's* 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20th Lines are the 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, and 48th Lines of Mr. *Pomfret's* Poem on *Love triumphant over Reaſon*; and pretty well toward the latter End of the ſame Poem, Page 22, are the firſt four that *Drury* makes uſe of; and *his* following four, *viz.* 5, 6, 7, and 8th, in the ſame *Book*, in a Poem entituled *Reaſon*, are there the 7, 8, 9, and 10th.—I hope you'll write to him hereof, and laſh him, as he deſerves; he being moſt openly and notoriouſly (as is ſhewn) *a Yorkſhire-Bite.*—If he will very ſubmiſſively aſk *your* Pardon, and make a tolerable Defence, and an elegant Apology for his *Plagiariſm*, you may be moderate in (your Correction or) expoſing him, if he heartily and ſincerely deſires it.—But was *he* left to *my* Mercy; I would compoſe half a dozen of the moſt ſatyrical Lines upon him I could, and have them publiſhed.

Of the ECLIPSES, this Year 1757.

THERE will be four *Eclipſes*, two of each *Luminary*. On *February* the 4th, at 7 o'Clock in the Morning, the *Moon* will be eclipſed 6° 43′, in ♌ 16°, part only viſible, becauſe the *Moon* ſets eclipſed.

February the 18th, at 1 o'Clock, the *Sun* will be eclipſed in the Beginning of ♓; ſo ſmall as to be inviſible.

July the 30th at 50′ paſt 11 at Night, the *Moon* will be eclipſed 11° 32′ in ♒ 7° 50′ viſible.

Auguſt the 14th at 45′ after 10 at Night, the *Sun* will be eclipſed in ♌ 22° 10′ inviſible.

We may alſo expect, towards the latter End of this Year, or in the Beginning of the next (1758) the Return of the famous *Comet* of 1682 Which (it is to be hoped) will not be attended with any of thoſe dire Effects dreamed of by ſome *Philoſophers!*

CHARLES WILDBORE.

Careleſs Jack of *Cambridge*, has ſent the following *Calculation* of the *Moon's* Eclipſe, from Mr. *Flamſtead's*, and Mr. *Dunthorne's* Tables.

	FLAMSTEAD'S.				DUNTHORNE'S,			
	D.	H.	'	"	D.	H.	'	"
In the Year 1757, the equal Time of the true Oppoſition of the Sun and *Moon* is, *Feb.*	3	19	22	4	3	19	14	26
At which Time	S.	o			S.	o		
The mean *Anomaly* of the EARTH	7	6	42					
The *Sun's* true Place	10	15	47	22	10	15	46	11
Annual Argument	7	6	22	22				
Moon's true Place in her Orbit	4	15	47	22	4	15	44	28
Her true hourly Motion			30	59	Ecliptick		30	14
Sun's true hourly Motion			2	32			2	32
Hourly Motion of *Moon* and *Sun*			28	27	in Eclip.		27	42
Argument of *Latitude*	11	23	11	50	11	23	11	13
Abſolute Equation of Days	*Add*		10	2			9	59
The *apparent* Time of ☍ in Orbit	3	19	12	46				
Time of Reduction *Add*			3	47			1	43
The *apparent* Time of ☍ in Ecliptick	3	19	16	33	4	15	46	11
Moon's horizontal *Parallax*			55	44			54	35
Sun's Do.				10				10
Sum of the horizontal *Parallaxes*			55	54			54	45
Semidiameter of *Sun*			16	19			16	21
Semidiameter of EARTH'S *Shadow*			39	35			38	24
					increaſed		39	14
Moon's Semidiameter			15	7			15	8
Semidiameter of *Moon* and *Shadow*			54	42			54	22
Moon's Latitude *South*			37	36			37	38
The Angle of the way of the *Moon* and *Sun*, with a Circle of Lat.							84	18
The neareſt approach of the Centers of *Moon* and *Shadow*							37	2
Parts deficient			17	6			17	9
Digits eclipſed		6	47	3		6	47	
The Time between the *true* and *mean Eclipſe*							7	57
Equal Time of the greateſt Obſcuration					3	19	6	29
E. Ap. Time of the greateſt Obſcuration	3	19	8	59	3	19	16	28
Motion of Semi-duration			39	43			37	28
Time of Semi-duration		1	23	46		1	20	42
The Beginning	3	17	45	13	3	17	55	46
The End	3	20	32	45	3	20	37	10
		H.	'	"		H.	'	"
Duration		2	47	32		2	41	24

Mr. *Luke Elſtob* calculates 1757, *Feb.* 3. — 19h. 6, Digits 6 43

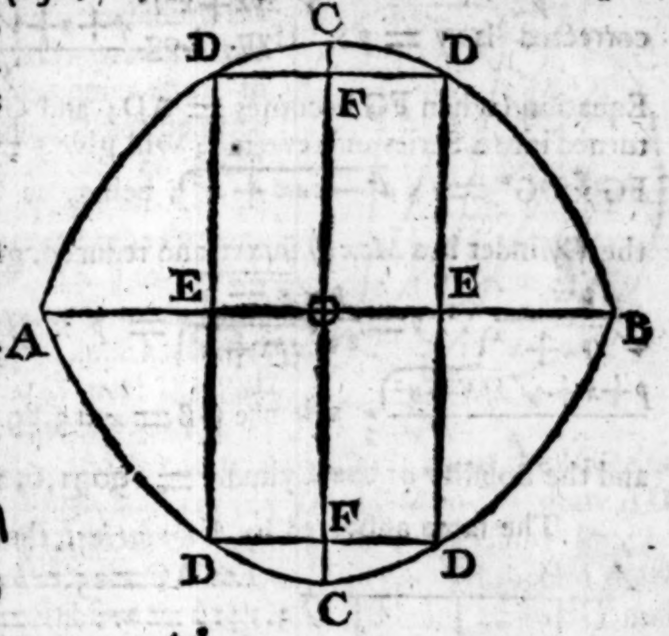
Mr. *Edward Greenſted's* for LONDON and ROCHESTER.

LOND. Ap. Time Morning beg. 5h. 21' Mid. 6h. 46'. End 8h. 11'. Dur. 2h. 50.
ROCHESTER, 5 23 6 48 8 13

Anſwers

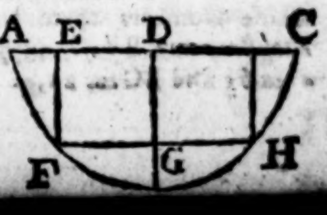
Anſwers to the QUESTIONS in laſt Year's *Diary*.

1 Queſtion (151) anſwered by Mr. *Lionel Charlton*.



SUPPOSE $a=,7854$ = Area of Unity; $x=20=$ CO; $y=25=$ AO; $p=$ Parameter of the Catenary; $u=$ AC; and $z=$ CF; then by the Nature of the Catenary, $uu=2px+xx$. Whence $u=\sqrt{2px+xx}$, $\dot{u}=\frac{p\dot{x}+x\dot{x}}{\sqrt{2px+x}}$; and $\dot{y}=\sqrt{\dot{u}^2-\dot{x}^2}=\frac{p\dot{x}}{\sqrt{2px+xx}}$; the Fluent of which gives $y=p\times$ Hyperbolic Logarith. $\frac{p+x+\sqrt{2px+xx}}{p}$. In which Equation the Value of p, by the Method of Trial and Error is found $=18,233$. Now, ſince $x-z=$ DE; and $p\times$ Hyp. Log. $\frac{p+z+\sqrt{2pz+z^2}}{p}=$ DF. Therefore, putting $F=$ Hyp. Log. $\frac{p+z+\sqrt{2pz+z^2}}{p}$, the Content of the Cylinder will be $8apF\times\overline{x^2-2xz-z^2}$, which (by the Queſt.) is to be a *Maximum*; whence we have $2Fz\dot{z}-2xF\dot{z}+\frac{x^2\dot{z}-2xz\dot{z}+z^2\dot{z}}{\sqrt{2pz+zz}}=0$; which being divided by $z\dot{z}-x\dot{z}$ gives $2F+\frac{z-x}{\sqrt{2pz+zz}}=0$. And this Equation being ſolved, by the Method of Trial and Error, gives $z=3,928$. Conſequently the Length of the Cylinder is 24; and its Diameters each $=32,144$.

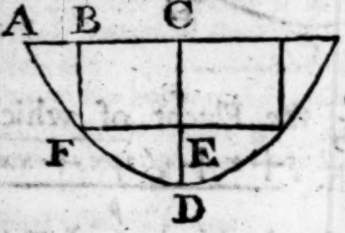
The ſame anſwer'd by *Cha. Wildbore*.



Let DB $=a$; AD $=b$; GB $=x$; FG $=y$; and the *Tenſion* at B, or Parameter of the Curve $=p$; then the Equation of the Curve being $\frac{\overline{\dot{x}^2+\dot{y}^2}\,^{\frac{1}{2}}}{}$

$-1 = \frac{x}{p}$; we have $\dot{y} = \frac{p\dot{x}}{\sqrt{\overline{2px+x^2}}}$. The Fluent of which corrected is $y = p \times$ Hyp. Log. $\frac{p+a+\sqrt{\overline{px+x^2}}}{p}$, which Equation (when FG becomes = AD; and GB to DB) being turned into a Series and reverted; will give $p = 18,232$. Now $FG \times DG^2 = y \times \overline{a^2-2ax+x^2}$; being, as (the Solidity of the Cylinder is a *Max.*) fluxed and reduced, gives $\dot{y} = \frac{2y\dot{x}}{a-x} = \frac{p\dot{x}}{\sqrt{\overline{2px+x^2}}} \therefore y = \frac{p \times \overline{a-x}}{2\sqrt{\overline{2px+x^2}}} = p \times$ Hyp. Log. of $\frac{p+x+\sqrt{\overline{2px+x^2}}}{p}$; whence $GB = x = 3,89$; $FH = 23,426$; and the Solidity of the Cylinder $= 19091,6$, may be found.

The ſame anſwered by *Tabularius*, the Propoſer.



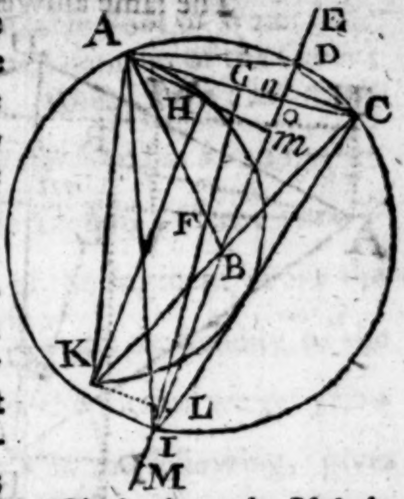
Let $AC = 25, = b$; $CD = 20, = c$; $3,1416 = m$; $DE = x$; $CE = BF = c - x$; and $FE = BC = y$. Then by the Property of the *Catenaria*, $b = 2,30258\,a \times$ Log. $\frac{a+c+\sqrt{\overline{2ac+c^2}}}{a}$ from which a may be found. Now, the Solidity of the Cylinder will be expreſſed by $2my \times \overline{c^2+2cx+x^2}$, a *Maximum.* In *Fluxions*, $c^2\dot{y} - 2cx\dot{y} - 2cy\dot{x} + a^2\dot{y} + 2yx\dot{x} = 0 \therefore \dot{y} = \frac{2cy\dot{x} - 2yx\dot{x}}{c^2-2cx+x^2} = \frac{2y\dot{x}}{c-x} = \frac{a\dot{x}}{\sqrt{\overline{2ax+x^2}}}$ by the Nature of the Curve $\therefore y = \frac{a \times \overline{c-x}}{2\sqrt{\overline{2ax+x^2}}}$; and $\therefore \frac{c-x}{\sqrt{\overline{2ax-x^2}}} = 4,60516 \times$ Log. $\frac{a+x+\sqrt{\overline{2ax+x^2}}}{a}$; from whence x may be found, and thence y; and conſequently the Solidity of the Cylinder required.

N. B. *The above was inſerted before we received his Solution this Year, in which he brings out* $a = 18,232$; $c - x = 16,1064$; $2y = 23,4258$; *and thence the Solidity* $= 19091,59797$.

It was anſwered in the ſame Manner, by Meſſ. *Bamfield* and *Garrard*, whoſe Numbers agree with the above inſerted. Meſſ. *Bevil*, *Gaſkill*, *Kingſton*, and *Rebuſt*, ſuppoſing AC inſtead of 2 A C. given = 50, find $a = 65$ and BC = 28, [illegible]

8 Queſt.

(2) Queſtion 152. anſwered by Mr. *Charles Wildbore.*

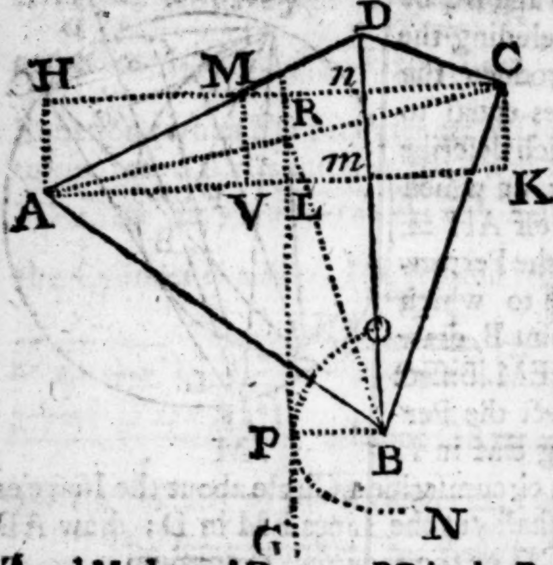


Conſtruction. Let AB and BC be the two given Lines, including the given Angle ABC; produce the Side BC till BK becomes equal to BC; draw AK, upon which deſcribe the Semi Circle AHK; on which from the Point A, ſet off AH = the given Difference of the Perpendiculars; draw HK ∥ to which through the angular Point B, draw the indefinite right Line EM. Biſſect AC in G, and at G erect the Perpendicular GI, meeting EM in I; draw AI, and IC; and circumſcribe a Circle about the Iſoſceles Triangle AIC, which ſhall cut the Lines EM in D; draw AD and DC, ſo ſhall ABCD be the required Trapezium.

Demonſtration. Produce AH to *m*, and parallel thereto draw *n* C and KL; alſo join AF, CF; then KB being = to BC, and the Angles *n* BC, and KBL = to each other; and the Angles *n* and *m*, being right Angles, the two Triangles *n*BC, KBL are not only *ſimilar* but *equal*; and ∴ AH is the given Difference of the Perpendiculars. Alſo the Triangle AIC being Iſoſceles, the Arcs AI, and IC, are equal. Conſequently the diagonal IBD, divides the Angle ADC into two equal Parts. *Q.E.D.*

Calculation. Firſt, in the Triangle ABC, there are given AB, BC, and the Angle ABC, to find the reſt. *Secondly*, in the Triangle ABK; are given AB, BK; and the Angle ABK, to find the reſt. *Thirdly*. In the right angled Triangle AHK, are given AH, and AK, to find the reſt. *Fourthly*, In the right angled Triangle A*m*B, are given AB, and the Angle *m* AB (HAK—KAB) to find the reſt. *Fifibly*, and in the right angled Triangle A*m*O, there are given A*m*, and the Angle OA*m*, to find the reſt. And *ſixthly*, In the right angled Triangle OGI, are given GO, and the Angles, to find the reſt. And then, *ſeventhly*, In the right angled Triangle CGI, there are given GC, and GI, to find the Angle GCI; which as it is contained in the ſame Segment of a Circle as ADI, muſt be equal to it. And therefore, *laſtly*, in the Triangle ADC, there is given the Side AC, and all the Angles; to find AD = 50,8; DC = 19 and the whole Area of the Trapezium = 174,44.

The ſame anſwered by Mr. *Tho. Garrard.*



Conſtruction. Draw AC, which biſſect in R, with the Radius BP = half the Difference of the Perpendicular A*m* and C*n*, deſcribe the Arch OPN; from the Point R, draw RG, to touch the Circle at P; and thro' B, and ∥ to RG draw BD for the Diagonal of the Trapezium. In the perpendicular C*n* continued, take *n*M = *n*C, and thro' the Points A and M, draw AD to cut BD in the Point D; laſtly, draw DC which compleats the Trapezium ſought.

Demonſtration. Let the Parallelogram HK be compleated; then becauſe RG (by Conſtruction) is a Tangent to the Circle NPO in the Point P; the Angle BPL is a right one; and ſeeing RP is parallel to DB, and alſo biſſects the Diagonal AC; it muſt alſo biſſect the Sides HC and AK: and therefore PB, L*m*, and S*n*, are all equal and parallel, and A*m* — C*n* = 2PB as required. Laſtly, becauſe *n*M = *n*C, and D*n* is perpendicular thereto, therefore the Angle ADC is biſſected by BD. *W. W. D.*

Trigonometrical Calculation. In the Triangle ABC are given AB = 60, BC = 50, and the Angle ABC = 74°, whence AC is had = 66,67966. The Angle CAB = 46° 7′ 16″; and ACB = 59° 52′ 44″. Then in the △ BRC is known RC = (33,33983) = half AC, and BC, and the Angle RCB; whence we get BRC = 79° 12′ $7''\frac{1}{2}$; RBC = 40° 55′ 9″, and RB = 44,02778. Now in the right angled Triangle BPR is known BR and BP, whence we have the Angle PRB = RBD = 19° 55′ 9″ ∴ DBA = 53° and DBC = 21°. Now in the right angled Triangles A*m*B, and C*n*B are known a Side and an Angle in each, whence we get B*m* = 36,1088, A*m* = 47,9184, B*n* = 46,6790, and C*n* = *n*M = 17,9814. Draw MV parallel to DB, then A*m* — M*n* = AV = 30, and B*n* — B*m* = MV = 10,5702. Then by ſimilar Triangles AV : VM :: A*m* : *m*D = 16,8836 ∴ BD = 52,9924, and the Area = 1744,4178.

After the *firſt* of theſe Methods it was anſwered by Mr. *Moſs* the Propoſer: and according to the *latter* by Mr. *Enefer*. It was alſo algebraically ſolved by Meſſ. *Bamfield*, *Charlton*, *Grimes*, *Kingſton*, *Rebuſs*, and ſome others. Mr. *Gaſkell* has conſtructed it in a Manner ſomewhat different from both, but Room will not admit its Publication.

(3) Queſt. 153. anſwered by Mr. *Will. Kingſton.*

Let $a = ,62,5$℔. the Weight of a Cubic Foot of Water; $c = ,5236$; $b = ,92989$; $d = 1,25$, $x =$ Diameter of the Globe; and $y =$ a Cubic Foot of Wood. Then, as $a : cx^3 :: y : \frac{cyx^3}{a} =$ the Cubic Inches in the Water. And as $b : 1 :: \frac{cyx^3}{ab}$: the Cubic Inches immerſed in the Liquor. Hence $12cx - 16c = ca^3 - \frac{cyx^3}{a} =$ the Solidity of the Segment above the Water; and $3cdx^2 - 2cd^3 = cx^3 - \frac{cyx^3}{ab} =$ the Solidity of the Segment above the Liquor. From the former we get $y = a + \frac{16a}{x^3} - \frac{12a}{x^2}$; which wrote for y in the following, gives $3abd^2x - 2abd^3 = abx^3 + ax^3 - 16a + 12ax \therefore 16 - 2bd^3 = bx^3 + x^3 + 12x - 3bd^2x$. Solv'd, gives $x = 9,51 =$ the Diameter.

The ſame anſwered by Mr. *Zach. Gaſkell.*

Put $m = 2$; $n = 1,25$; $c = 3,1416$; $p = ,5236$; and x for the Sphere's Diameter. Then by common *Theorems* $px^3 - \frac{1}{2}cxm^2 + \frac{1}{3}cm^3$ will be the Solidity of the immerſed Segment in the denſer Fluid; and $px^3 - \frac{1}{2}cxn^2 + \frac{1}{3}cn^3$ the Solidity when in the other. Now as the Denſity of all Bodies are to each other inverſely as the Solidity of the Space occupied; it will be as $px^3 - \frac{1}{2}cxm^2 + \frac{1}{3}cm^3 : px^3 - \frac{1}{2}cxn^2 + \frac{1}{3}cn^3 :: ,92989 : 1$. After multiplying Extremes and Means, and clearing the Equation, we ſhall have $108,986x - x^3 = 176,401$. Solv'd $x = 9,509$, the required Diameter.

Mr. *Samuel Bamfield* anſwers it thus.

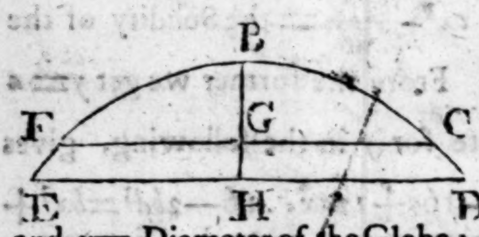
Put $s = ,5236 =$ a Globe's Solidity, whoſe Axis $= 1$; $a = ,92989$, $c = 2$; $d = 1,25$; and $x =$ Globe's Diameter; hence $sx^3 =$ it's Solidity, and $sx^3 - 3ccsx + 2c^3s =$ the immerſed Part in the Water; and $sx^3 - 3ddsx + 2d^3s =$ the immerſed Parts in the other Liquid $\therefore$ by Hydroſtaticks, the immerſed Parts will be inverſely as the Denſities of the Liquids; whence $a \times \overline{sx^3 - 3d^2sx + 2d^3s} = sx^3 - 3ccsx + 2c^3x \therefore ax^3 - 3addx + 2ad^3 = x^3 - 3ccx + 2c^3$; which Equation ſolved, $x = 9,5089 =$ the Globe's Diameter required.

The ſame anſwered by the Propoſer, Mr. *Abr. Botham.*

Let $D =$ the Diameter of the Globe; $h = 2$; $m = 1,25$, and $a = ,92989$. Alſo let $p = 0,5236$; then $pD^3 =$ the Globe's Solidity; and $pD^3 + 2ph^3 - 3pDh^2 =$ a Bulk of Water equal in Weight to the Globe, being alſo equal to the Solidity of that

Part of the Globe immerſed in Water. And $pD^3+2pm^3-3pDm^2$, is a Bulk of the Liquor of the ſame Weight with the Globe. Therefore theſe Bulks muſt be in the reciprocal Ratio of their ſpecific Gravities, that is $a:1::pD^3+2pb^3-3pDb^2:pD^3+2pm^3-3pDm^2$; in a direct Ratio. Therefore $pD^3+2pb^3-3pDb^2=paD^3+2pam^3-3apDm^2$, and by Reduction $\overline{-1+a}\times D^3+\overline{3bb-3amm}\times D=2b^3-2am^3$. Solv'd, gives $D=9,51$ nearly.

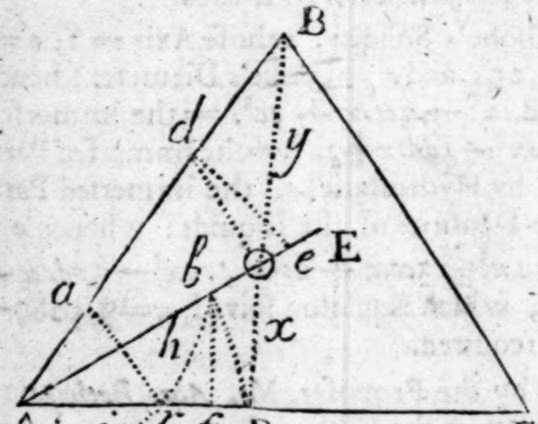
Alſo anſwered by Mr. *L. Charlton*, as under.



The ſpecific Gravity of the two Fluids being as the Quantity of Wood immerſed in each; ſuppoſe $a=1\tfrac{1}{4}$; $b=2$, $=BH$; $c=,92989$; $p=,7854=$ Area of Unity; and $x=$ Diameter of the Globe; then the Content of the Globe will be $=\tfrac{2}{3}px^3$; the Content of the Segment FBC $=2pa^2x-\tfrac{4}{3}pa^3$; and the Content of the Segment DBE $=2pb^2x-\tfrac{4}{3}pb^3$ ∴ the Content of the Wood immerſed in the Water is $\tfrac{2}{3}px^3-2pb^2x+\tfrac{4}{3}pb^3$; and the Content of that immerſed in the other Fluid is $\tfrac{2}{3}px^3-2pa^2x+\tfrac{4}{3}pa^3$; Multiply this laſt Content by c, ſo will $\overline{\tfrac{2}{3}px^3-\tfrac{2}{3}pa^2x+\tfrac{4}{3}pa^3}\times c=\tfrac{2}{3}px^3-2pb^2x+\tfrac{4}{3}pb^3$; which Equation being reduced, gives $x^3-109x=176,4$; and this being ſolved gives $x=9.51$ Inches $=$ Diameter of the Globe.

We had other good Solutions to this Queſtion from Meſſ. *Will. Enfer*, *Tho Garrard*, *Tabularius*, and ſeveral others, which cannot be inſerted for want of Room.

4 Queſt. (154) anſwered by Mr. *Tho. Garrard*.



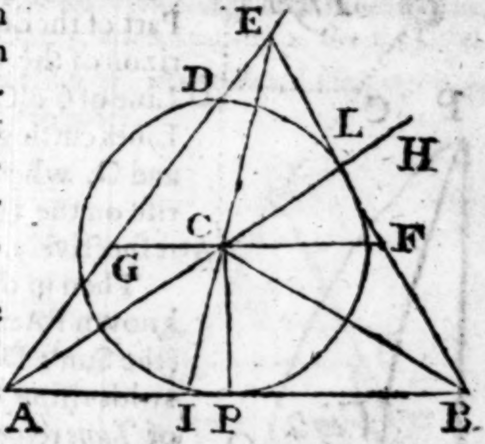
In the annexed Scheme let A repreſent the Place at the firſt Obſervation; D the ſecond, and C the third; O one of the Steeples, and B the other. Put n for the Sine of 22° 30′ the Angle BAO; m for the Sine of 33° 45′ the Angle CAO; $c=AD=2$; $p=DC=3$; $x=DO$, and $y=BO$. Then $x:y::p:\frac{py}{x}=BC$ (*per* 3 *Eu.* 6) and $x:m::c:\frac{cm}{x}=AOD=AOB$. Again, $n:y::\frac{cm}{x}:\frac{cmy}{nx}=AB$ ∴ $AB:BC::\frac{cmy}{nx}:\frac{py}{x}::cm:pn$. Hence this eaſy

Conſtruction. Draw AC for the Meridian, in which ſet off $AD=2$, and $DC=3$. Alſo draw AE and AB, of a convenient Length; the former making an Angle of 3 Points, and the latter of 5 Points with AC; upon A as a Centre, with the Radius DC, deſcribe the Arch *de*; and let fall the Perpendicular *do.* Again, with one Foot of the Compaſſes in A, with the Radius AD, deſcribe the Arch *b*D, and let fall the Perpendicular *bf*; make $Aa=do$, and upon *a*, with the Radius *bf*, deſcribe the Arch *b r i* thro' *a*, and the Point of Interſection *r*, draw *ar*; then thro' C, and parallel to *ar*, draw BC. Laſtly, thro' D and Point B draw DB; ſo ſhall O and B be the true Poſition of the Steeples required.

For *ar* and A*a*, are reſpectively $=cm$ and *pn* by Conſtruction; alſo *ar*, is parallel to BC $\therefore$ by ſimilar Triangles $AB : BC :: cm : pn$ the ſame Analogy as before; from which Analogy and Axiom the firſt of plain Trigonometry, we get the Angle $ACB=53^\circ\ 35'\ 6''$, whence we have Data enough to find the Diſtance of the Steeples, $=2,130272$ Miles; and their Bearing $6^\circ\ 2'\ 26''$ to the Northward of the *Weſt*, and Southward of the *Eaſt* of each other.

The ſame conſtructed and anſwered by Mr. *Zach. Gaſkell*, the Propoſer.

Conſtruction. Draw AB for the Meridian, and the indefinite Lines AH and AE, making their reſpective Angles with AB, according to the Data, then on the Line AH as at C (taken any where at Pleaſure) deſcribe the Circle PLD with the extent of the Perpendicular CP; thro' C draw FG parallel to AB, make CF to CG, as 3 to 2. Then thro' F, draw BE, ſo as juſt to touch the Circle's Periphery; thro' C draw EI; then will I be the *Inn*; B the laſt Place of Obſervation; and C and E, the Situation of the two Steeples.



This Way of Conſtruction (which I did not think of till after the Solution was ſent laſt Year) points out a Method to reſolve it by common Trigonometry only; for as Sine $<$GAC : GC (z) : : Sine $<$EGC : AC. And as Rad. : AC : : Sine $<$CAI to the Rad. of the Circle $=CP=CL$ (L being the Tang. Point of the Line EB) then as CF (3) : Rad. : : CI : Sine $<LFC=<EBA=53^\circ\ 35'\ 6''$, which being had, calling AI (2) and BI (3) proceeding in the Operations BE will be found $=4,419547$.

and IE = 3,57644, and the Coſine of the ∠ BIC = 6° 2′ 30″. The very ſame that reſults from the other Method, being their Bearing from the *Inn* ſo much northerly from the Weſt; then as the Angle is biſſected by the Line BC, as IB : BE : : IE — CE : CE. Whence

$$CE = \frac{IE \times BE}{IB + BE} = 2{,}1303 \text{ Miles, as before.}$$

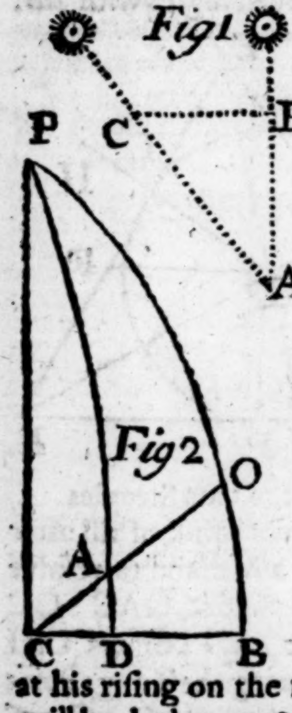
Mr. *Eneſer* has alſo conſtructed this *Problem*, in a manner not much different from that of Mr. *Garrard's*. It was alſo *algebraically* ſolved, by Meſſ. *Bamfield*, *Grimes*, *Holroyd*, *Kingſton*, and ſeveral others.

5 Queſtion (155) anſwer'd by Mr. *Tho. Hare*.

I find *per* Trigonometry (ſee the Fig. in laſt Year's Diary) the Angle BAC = 36° 52′ 11″, the Difference of the Amplitudes of the *Sun* on *April* 1ſt, and *June* 7th. Now, by the Queſtion, and Prob. 24th of Mr. *Simpſon's* Trig. as Tang. 9° 5′ 15″ : Tang. 13° 42′ 39″ : : Tang. 18° 26′ 6″ : Tang. 26° 57′ 1″ = half the Sum of the Amplitudes; hence the Amplitudes are ſeparately known. Conſequently the required Latitude is 57° 1′ 14″.

The ſame anſwered by Mr. *Tho. Garrard*, of *Ipſwich*.

In the right angled (in this Caſe) plane Triangle ABC are given all the Sides; whence by plain *Trig*. we get the Angle A = 36° 52′ 12″ = the Difference between the Sun's Amplitude on the 1ſt of *April* 1754, and the 7th of *June* following.



Now let P repreſent the North Pole, CB Part of the Equinoctial, CO Part of the Horizon of the Place ſought, PC the Hour-Line of 6 o'Clock; PA and PO, other Hour Lines cutting the Horizon in the Points A and O, where the Sun was obſerved to riſe on the 1ſt of *April*, and 7th of *June* reſpectively.

Then in the ſpherical Triangle PAO, is known PA = 85° 28′, and PO = 67° 14′ (the Sun's Diſtance from the North Pole, at his riſing on the 1ſt of *April*, and 7th of *June* reſpectively) and AO the Difference of his Amplitudes at thoſe times; whence the angle PAO will be found = 57° 13′ 47″.

Now in the right angled ſpherical Triangle CAD is known the ſaid Angle A, and the ſide AD = 4° 32′, the Sun's Declination at his riſing on the 1ſt of *April* 1754. Whence the Angle ACD will be had = 33° 2′ 52″, whoſe Complement is 56° 57′ 8″, the Latitude required.

The ſame anſwered by Mr. *Will. Eneſer.*

The Triangle ABC (ſee the above Scheme, *Fig.* 1.) being right angled at B, the Angle A is found = 36° 52′ 12″. Then in *Fig.* 2. we have given PO and PA (each reſpectively equal to the Sun's Diſtance from the North Pole, at his riſing on *June* 7, and *April* 1) = 67° 14′, and 85° 28′ reſpectively; alſo AO, the Difference of his Amplitudes at thoſe Times (found as above) = 36° 52′ 12″, whence the Angle PAO = CAP is found = 57° 13′ 47″. Then in the right angled Triangle CDA, are known DA = 4° 32′ (= Complement of PA to a Quadrant) the Angle A as found above, and the right Angle D. Whence the Angle DCA is found = 33° 2′ 52″, whoſe Complement 56° 57′ 8″, is the Latitude required.

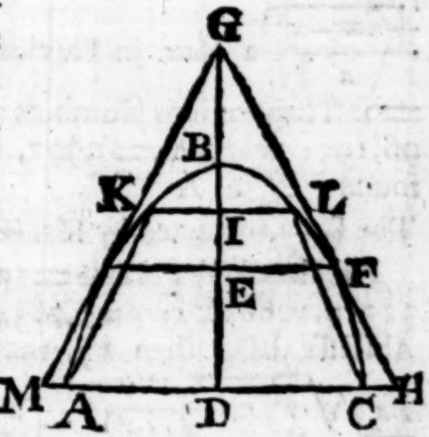
The ſame anſwered by Mr. *Cha. Maſon*, Jun. of *Sapperton.*

Let a and b = the Sine of the Sun's Declination, on *April* 1ſt, and *June* 7; p and q = the Sine and Coſine of 36° 52′ 11″ = Diff. of Amplitudes; x, and y = Sine and Coſine of the Sun's Amplitude on *June* the 7th; then will $qx - py$, expreſs the Sine of his Amplitude on the 1ſt of *April*; by *Spherics*, as $x : 1$ (= Rad.) $:: b : \frac{b}{x}$ = Coſine Lat. And, as $qx - py : 1 :: a : \frac{a}{qx-py}$ = Coſine Lat. Hence $\frac{b}{x} = \frac{qx-py}{a} \therefore \frac{bq-a}{bp} = \frac{y}{x} = ,9871657$ = Cotan. of 45° 22′ 12″. Hence the Lat. required = 57° 0′ 28″. N.

This Queſtion was alſo truly and methodically ſolved by Meſſ. *Bevil*, *Botham*, *Drury*, *Gaſkell*, *Holroyd*, *Kingſton*, *Spicer*, and ſeveral others. See the Catal.

6 Queſt. (156) anſwer'd by Mr *Cha. Wildbore* of *Nottingham*, the Propoſer.

Let $p = 3,1416$, s = the Solidity, c = the Convex Surface; a = the Parameter. and x = BD; then will $\frac{p \times \overline{a^2 + 4ax}|^{\frac{3}{2}}}{6a} - \frac{pa^2}{6} = c$, and $\frac{pax^2}{2} = s$, from which Equations a and x may be found. And when the circumſcribing Cone is a *Min.* GE will = $\frac{2}{3}$GD (*vide* my Solution to Qu. 8) For the greateſt inſcribed Conic Fruſtrum, let KI = y, AD = Bb, then $c = \frac{y^2}{a}$ = ID; and (by a well known Theorem) $\overline{c - \frac{y^2}{a} \times \sqrt{pb^2 \times py^2} + pb^2 + py^2}$ = the Solidity of the Fruſt. a *Max.* in Fluxions is $bcay\dot{y} + 2acy\dot{y} - 3by^2\dot{y} - 2by^2\dot{y} - 4y^3\dot{y} = 0$; reduced $4y^3 + 3by^2 = bca$, from which y may be found.



The Dimenſions of the Paraboloid were intended to have come out in whole Numbers; but thro' a numerical Error in finding the convex Surface, the Queſtion now admits of two affirmative Anſwers, both in broken Numbers.

The ſame anſwered by Mr. *T. Drury* of *Great Houghton*, *Yorkſh.*

Let s = Superficies of the Paraboloid, Q = Solidity, $p=2,0944$, $q=0,3927$, x = Abſciſſa, and $2y$ = Ordinate; alſo let $\frac{q}{Q}=a$; then $x=\frac{a}{4y^2}$, which being ſubſtituted in the following Equation for the Superficies, we have $\sqrt{\frac{a^2}{4y^4}+y^2}+\sqrt{\frac{a^2}{4y^4}+y^2}+y\times y=\frac{s}{p}$, reduced $y=64,1229$, and $x=5,0431$. Now, for the leaſt circumſcribing Cone, put a = DB (ſee Fig. above) b = DA, $p=,7854$, and x = BG = BE; and *per* Conics $a:b^2::x:\frac{b^2x}{a}$ = EF; and *per* ſim. Triangles $2x:2\sqrt{\frac{b^2x}{a}}::a+x:b\sqrt{\frac{a^2+2ax+x^2}{ax}}$ = MH; whence its Solidity is $pb^2\times\frac{a^3+3a^2x+3ax^2+x^3}{3ax}$ a *Min.* in Fluxions and reduced gives $x=\frac{1}{2}a$; hence we ſee the Paraboloid cuts the Cone at $\frac{2}{3}$ of its Altitude, and conſequently its Solidity becomes known. Again, for the greateſt inſcribed conic Fruſtum put a = Abſciſſa, b = Semiordinate, and x = ID the Height of the Fruſtum; then *per* Conics $2\sqrt{\frac{ab^2-b^2x}{a}}$ = KL; and its Solidity $\frac{4pb^2}{3}\times\sqrt{\frac{ax^2-x^3}{a}+\frac{2ax-x^3}{a}}$ a *Max.* in Fluxions $\frac{2ax\dot{x}-3x^2\dot{x}}{2\sqrt{a^2x^2-ax^3}}+\frac{2a\dot{x}-3x^2\dot{x}}{a}=0$. Thrown into Numbers is $x^3-12,2925x^2+57,2238x=96,195$; whence $x=3,997$, and likewiſe its Solidity is eaſy found. *Q. E. I.*

The ſame anſwered by Mr. *W. Spicer* of *Alleſley*, near *Coventry*.

Put the curve Surface $=12996,3609=d$, the Solidity $=32572,1088=s$; $c=0,7854$, y = Semiordinate AD, and x = Abſciſſa BD, then by the Doctrine of Fluxions is had $\frac{2c}{3}\times\sqrt{\frac{y^2}{x^4}\times\overline{y^2+4x^2}^{3}}-\frac{2cy^4}{3x^2}=d$, and $2cy^2x=s$; from which two Equations (by Subſtitution) we have $128sc^2x^6-9d^2cx^5+48s^2cx^3-3ds^2x=-6s^3$; ſolved $x=5,0505$ and $y=64,07598$. For the leaſt circumſcribing Cone, put b = AD a = BD, and x = CD. Th. *per* Property of the Curve $a:b^2::$

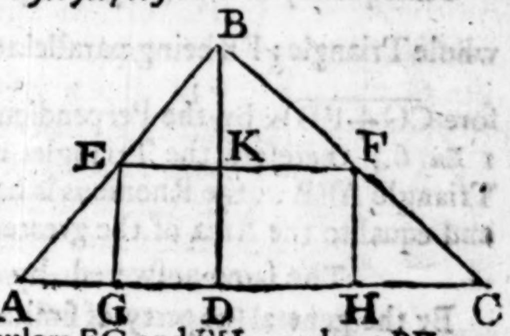
$x-b$

$x-a:\frac{b^2}{a}\times\overline{x-a}=\overline{FE}^2$; and (by ſim. Triangles) $4\times\overline{x-a}^2:\frac{b^2}{a}\times\overline{x-a}::x^2:\frac{b^2}{4a}\times\frac{x^2}{x-a}=\overline{MD}^2$; Th. $\frac{cb^2}{3a}\times\frac{x^3}{x-a}=$ Cone's Solidity, a *Maximum*; in Fluxions and reduced gives $x=\frac{3a}{2}=7,57575$; and $MD=\frac{3b}{2\sqrt{2}}=67,9628$. Again, for the greateſt inſcribed conic Fruſtum, put $x=IL$. Th. $b^2:a::x^2:\frac{ax}{b^2}=BI$, and $a-\frac{ax}{b^2}=ID$; Th. $\frac{b^4+b^3x-x^4-bx^3}{\frac{3}{4}b^2}=$ conic Fruſtum, a *Maximum*. In Fluxions and reduced $b^3-4x^3-3bx^2=0$. Solved $x=29,181$. *W. W. R.*

This Queſtion was alſo truly and elegantly anſwered, by Meſſ. *Bamfield*, *Bevil*, *Charlton*, *Garrard*, *Gaſkell*, *Kingſton*, *Maſon*, *Rebuſs*, *Tabularius*, *Thompſon*, and others (ſee the Catalogue.)

7 Queſtion (157) anſwer'd by Mr. *Will. Eneſer*, of *Ipſwich.*

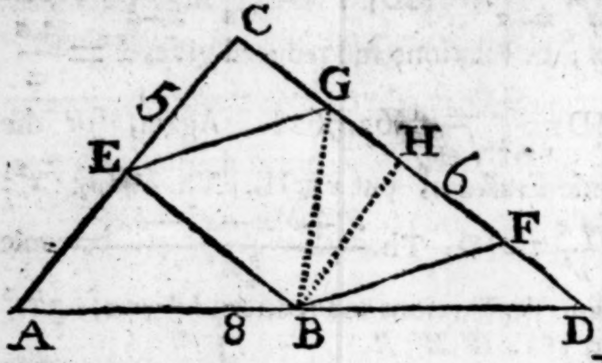
Since the Sides of the Triangle are in Proportion as 5, 6, and 8; put $10x=AB$, $12x=BC$, and $16x=AG$. Th. by a well known Rule $19x\times9x\times7x\times3x=240\times20$ (= the Square of the Area in Poles) $\therefore x^4=\frac{240\times240}{19\times9\times7\times3}$. Solv'd $x=2,0012551$. Then $10x=20,012551=AB=a$, $12x=24,0150612=BC=b$; and $16x=32,0200816=AC=c$; then $\frac{240\times2}{a}=23,984948=$ perp. BD which call p. Draw EF ∥ to AC and let fall the Perpendiculars EG and FH; and put $BK=z$.



Then by ſim. Triangles $p:a::z:\frac{az}{p}=EF$. Then $p-z\times\frac{az}{p}=$ Area of the Parallelogram, a *Max.* in Flux. $a\dot{z}=\frac{2az\dot{z}}{p}$. Solv'd $2z=p$. Th. EF $\left(=\frac{az}{p}\right)=\frac{a}{2}$. Hence it appears that the greateſt Parallelogram that can be inſcribed in any Triangle is that whoſe $\left\{\begin{matrix}\text{Altitude}\\ \text{Baſe}\end{matrix}\right\}=\frac{1}{2}$ the $\left\{\begin{matrix}\text{Altitude}\\ \text{Baſe}\end{matrix}\right\}$ of the given Trian. Whence it is evidently impoſſible for the Parallelogram to become a Rhombus, unleſs GE is greater than AE or leſs than EF. Conſequently one Side of the Rhombus muſt coincide with the mean Side of the Triangle; whence the Side of the Fiſh-pond is = 12,0075306, and its Area 120 Poles. *W. W. D.*

The ſame anſwered by Mr *Zach. Gaſkell.*

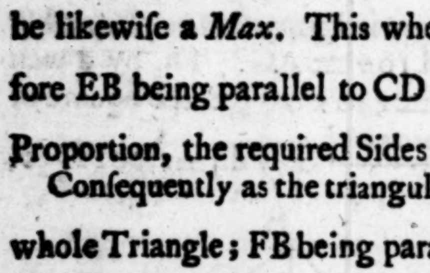
Put s, m, and p, for the nat. Sines of the Angles A, D, and C; b=AD, x=BD, and z=EB = the required Side; then by Trig. as BF (z) : m :: x : $\frac{mx}{z}$ = Sine <BFD. And as p : AB (=$b-x$) :: s:z; therefore $z=\frac{sb-sx}{p}$, whence the Sine of the Angle BFD= $\frac{pmx}{sb-sx}$; this when x into zz or its equal $\frac{\overline{sb-sx}\,z}{p}$ will be = to the Area of the Rhombus, a *Maximum*. Then will $bx-xx$ be likewiſe a *Max*. This when fluxed gives $x=\frac{b}{2}$. Therefore EB being parallel to CD $=\frac{CD}{2}$; whence by the Rule of Proportion, the required Sides are 12,0075 Poles reſpectively.



Conſequently as the triangular Space AEB is one fourth of the whole Triangle; FB being parallel to CD, and GF$=\frac{CD}{2}$; therefore $\overline{CG+FD}$ x by the Perpendicular BH is =GF x BH (*per* 1 *Eu.* 6.) therefore the Triangles ECG and BFD, are = the Triangle AEB ∴ the Rhombus is half the Content of the Field, and equal to the Area of the greateſt inſcribed Parallelogram.

The ſame anſwered by *Nottinghamienſis.*

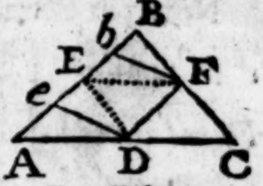
By the general Property of ſimilar Triangles, the Sides of the Triangle are eaſily found, *viz.* AC=8,005; AB =6,00376; and BC=5,00313 Chains.



Let each Side of the Triangle ABC be divided into two equal Parts, in the Points E, F, and H; ſo ſhall it be divided into four Triangles EBF, FHE, AEH, and HFC; equal in all reſpects to each other, and ſimilar to the whole. Set off FH from B to S; and parallel thereto, draw IF, LH; ſo ſo ſhall FILH be the required Rhombus, equal to half the Triangle ABC; and equal to the greateſt Parallelogram that can be inſcribed therein. (Vide *Simpſon's* Geometry, page 107.)

The

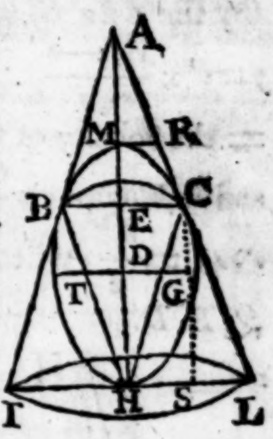
The ſame anſwered by *Tabularius*.



The Sides being 5, 6, and 8, I find the Area =14,98123 whence, from the given Area =15 ſquare Chains; I find, by duplicate Proportion, the Sides AC=8,005, AB=6,00376, and BC =5,00313; which being biſſected in D, E, and F, the Triangle will be divided into four equal ſimilar Triangles, and therefore into three Parallelograms AF, CE, and BD; each of them equal to half the Triangle, and each a *Maximum*, by the Writers on Fluxions: Now making Fb=be=eD=DF=3,00188=AE, the Rhombus Db will be that required, being equal to the Parallelogram AF, or BD.

This Queſtion was alſo truly and methodically anſwered by Meſſ. *Sam. Bamfield*, *Ab. Botham*, *Tim. Drury*, *Tho. Garrard* *Joſhua Holroyd*, *Will. Kingſtone*, *W. Spicer*, *H. Weetman*, and others. See the Catalogue.

8 Queſt. (158) anſwered by Mr. *Cha. Wildbore* of *Nottingham*.



As a greater Figure cannot poſſibly be inſcribed in the Curve HBMC than in its circumſcribing Cone IAL, the greateſt Cone BHC, that can be inſcribed in the Cone AIL will be the greateſt that can poſſibly be inſcribed in the Solid HBMC: conſequently the Cones and Solid coincide at B and C. It is alſo eaſy to conceive, that let the Curve be of what Kind ſoever it will, or if there be no Curve, the two Cones will ſtill bear the ſame Relation to each other: And therefore, if we ſuppoſe either of them, as for inſtance, the circumſcribing one, to remain fixed; then the inſcribed one, being as $EC^2 \times EH$, will, by reaſon that CS and SL are in a conſtant Ratio, be as $EC^2 \times SL$, and will be a *Maximum* when EC=2SL (ſee Mr. *Moſs*'s Demonſtration in the laſt Year's Diary, p. 21.) and by ſimilar Triangles HL : $\frac{1}{3}$ HL (=SL) : : AH : $\frac{1}{3}$ AH (=EH) or, which is the ſame Thing, $\frac{2}{3} : 2 : : EH : AH$. *Q.E.D.*

The ſame anſwered by Mr. *John Thompſon* of *Witherly Bridge*.

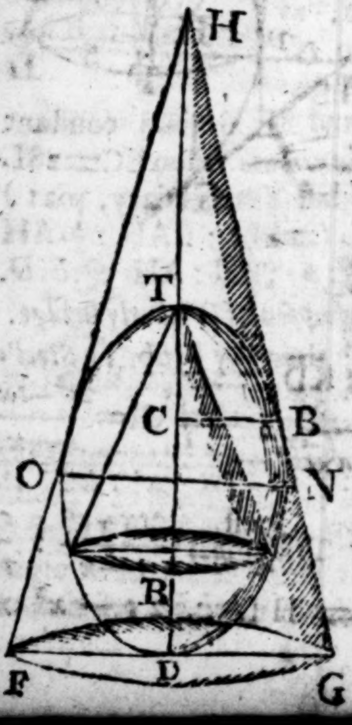
Put HD=t, DT=c, and ME=x; then (by Prop. 15 *Steel's* Conics) $t-x : t : : x : AM = \frac{tx}{t-x} \therefore \frac{tx}{t-x} + 2t = AH = \frac{2t^2-tx}{t-x}$ and $AE = \frac{2tx-x^2}{t-x}$ and (*per Conics*) $t^2 : c^2 : : 2tx-x^2 : \overline{BE}^2 \therefore \frac{c}{t}\sqrt{2tx-x^2} = BE$; and (*per ſim.* Triangles) $\frac{2tx-x^2}{t-x} : \frac{c}{t}\sqrt{2tx-x^2} : : \frac{2t^2-tx}{t-x} : \frac{c}{x}\sqrt{2tx-x^2} = HL \therefore 2t - x^2 \times$

$\frac{1}{tx-x^2}$ is a *Min.* In *Fluxions* and reduced $x=\frac{2}{3}t \therefore AH=4t$.

Now put $EH=v$, then $EM=2t-v$; and (*per Conics*) $t^2 : c^2 :: 2tu-v^2 : \overline{BE}^2 = \overline{2tv-v^2} \times \frac{c^2}{t^2} \therefore 2tv^2-v^3$ is a *Maximum*. *Fluxed* and reduced $v=\frac{4t}{3}$; and $\frac{4t}{3} : 4t :: \frac{2}{3} : 2$. *Q. E. D.*

The ſame anſwered by Mr. *W. Kingſton* of *Bath.*

Let $a=HM$, $b=TG$, $x=HE$; $a-x=ME$; and by the Property of the Curve we have $a^2 : b^2 :: ax-x^2 : \frac{b^2}{a^2} \times \overline{ax-x^2} = EC^2$; and $\frac{8cb^2x}{3a^2} \times \overline{ax-x^2} =$ the Solidity of the greateſt inſcribed Cone ($c=.7854$) a *Maximum*, and in Fluxions is $\frac{32b^2ax\dot{x}-48b^2x^2\dot{x}}{3a^2}=0. \therefore 2a-3x=0. \therefore x=\frac{2a}{3}$. Let $y=MR$, and by the Property of the Curve $\frac{b^2}{4y}=IH=HL$, and (by the 4 *Eu.* 6) we have $HA-a : y :: HA : \frac{b^2}{4y}$. Hence $HA \times y = b^2 \times \frac{HA-a}{4y} \therefore HA = \frac{ab^2}{b^2-4y^2}$. Then $\frac{16a}{6b^2y^2-24y^4} =$ the Solidity of the leaſt circumſcribing Cone, a *Minimum*, and in Fluxions is $\frac{96cab^6y^3\dot{y}-12ab^8y\dot{y}}{6b^4y^2-24y} = 0. \therefore 8y^2-b^2=0. \therefore 4y^2=\frac{b^2}{2}$; whence $HA=2a$. Therefore as $\frac{2}{3} : 2 :: \frac{2}{3}a : 2a$. *Q. E. D.*



Demonſtration, by Mr. *Steph. Metcalf*, the Propoſer.

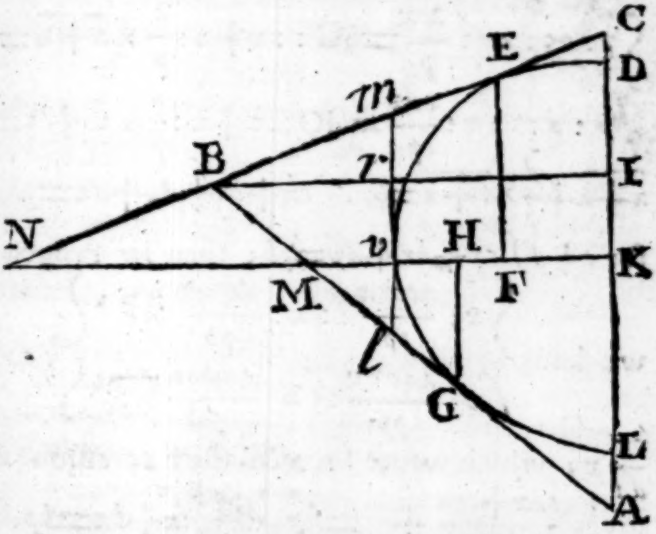
Let $TD=a$, $ON=b$, $TC=x$, and $BC=y$; then (by p. 32, of the Introduction to the Doctrine of Fluxions) the Altitude TR of the greateſt inſcribed Cone equals $\frac{2}{3}a=\frac{2}{3}$ TD. Again, by the Property of the Ellipſe $\frac{2a^2y^2}{ab^2-2b^2x}=HC$; but $y^2=\frac{b^2}{a^2}\times\overline{ax-x^2}$; therefore $HC=\frac{2ax-2x^2}{a-2x}$ and, by ſimilar Triangles $HC : 2CB :: HD : FG$, *i. e.* $\frac{2ax-2x^2}{a-2x} : 2y :: \frac{a^2-ax}{a-2x} : \frac{ay}{x} =$

FG; whence $\frac{a^2y^2}{x^2} \times \frac{a^2-ax}{3a-6x}$ or, $\frac{ab^2-b^2x}{x} \times \frac{a^2-ax}{3a-6x} = \frac{a^3b^2-2a^2b^2x+ab^2x^2}{3ax-6x^2}$ is a *Min.* which in *Fluxions* is $-3a^4b^2\dot{x}+12a^3b^2x\dot{x}-9a^2b^2x\dot{x}=0$. From which, after proper Reduction, and compleating the Square, I find $x=a$, or $\frac{1}{3}a$; but it is quite inconſiſtent, by the Nature of the Problem, that x ſhould equal a; conſequently it equals $\frac{1}{3}a$; hence the Altitude HD of the leaſt circumſcribing Cone equals $2a$. Therefore $\frac{2}{3}:2::\text{TR}:\text{HD}$. *Q. E. D.*

This Queſtion was alſo truly ſolved by Meſſ. *Bevil*, *Botham*, *Eneſer*, *Garrard*, *Gaſkell*, *Holroyd*, *Maſon*, *Spicer*, *Tabularius*, and ſome others.

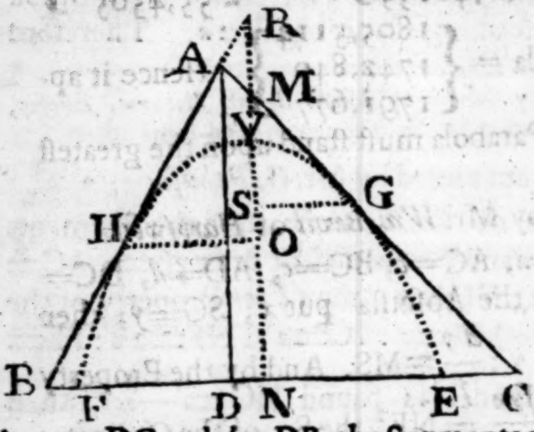
(9) Queſt. 159. anſwered by Mr. *G. Rebuſs.*

Having the three Sides of the Triangle, find the Segments $\text{IC}=33=a$; $\text{IA}=42=b$; and Perpendicular $\text{BI}=56=c$; $\text{AC}=75=d$; $\text{VK}=u$; $\text{VF}=z$; $\text{VH}=x$; then (*per* Property of the Curve, and ſim. Triangles) $\text{BI}=c:\text{IC}=a::\text{NF}=2z:\text{FE}=\frac{2az}{c}$. After the ſame Manner is found $\text{HG}=\frac{2bx}{c}$; then $lm=\frac{az+bx}{c}$. Again, as $\text{B}r:lm::\text{BI}:\text{CA}$ $\therefore d\times\overline{c-u}=az+bx$, and *per* Property of the Curve $v\text{F}:\overline{\text{FE}}^2::v\text{K}:\overline{\text{KD}}^2=\frac{4a^2uz}{c^2}$. Again, as $v\text{F}:v\text{H}::\overline{\text{IA}}^2:\overline{\text{IC}}^2$; $\therefore z=\frac{b^2x}{a^2}$, and by Subſtitution gives $x=\frac{a}{b}\times\overline{c-u}$, and $\overline{\text{KD}}^2=\frac{4b^2ux}{c^2}$. Whence $\overline{\text{KD}}^2=\frac{4ba}{c^2}\times\overline{c-u^2}$; and $\text{KD}=\frac{2}{c}\sqrt{ba\times\overline{cu-u^2}}$; $\therefore \frac{8}{3c}\sqrt{ba\times\overline{cu^3-u^4}}=$ Area of the inſcribed com. Parabola LGvED, *per* Queſtion muſt be a *Max.* or cu^3-u^4 in *Fluxions* and reduced, $u=\frac{3}{4}c=42=$ the Abſciſſa vK, and Ordinate $\sqrt{\frac{3ba}{c}}=64,4825=\text{LD}$. *Q. E. D.*



Corollary. When the Point B coincides with N, then the Triangle ABC will become *Iſoſceles*, and $b=a$; whoſe Abſciſſa will be the ſame as above (*viz.*) $vK=\frac{3}{4}c$, and Ordinate $DL=a\sqrt{3}$, which are the Dimenſions of the greateſt com. Parabola LGvED, that can be inſcribed in the given *Iſoſceles* Triangle ABC. From whence Mr. *Zach. Gaſkell's* Solution to Queſt. 133. p. 21. *Gent. Diary*, 1755, may be eaſily derived.

The ſame anſwered by Mr. *Tho. Garrard* of *Ipſwich.*



Let ABC repreſent the given Trian. FHVGEF its greateſt inſcribed Parabola ſought, VN its Axis, SG and HO Ordinates to the Points G and H, to which the Sides AC and AB are reſpectively Tangents.

Put $b=BC$, the Baſe, $p=AD$, the Perpendicular, $c=DC$ and $d=DB$, the Segments of the Baſe. And $x=MV=VS$, $v=VR=VO$, and $z=VN$. Then *per* ſim. Triangles

$$\left\{\begin{array}{l} p:c::2x:\frac{2cx}{p}=SG::x+z:\frac{c}{p}\times\overline{x+z}=NC \\ p:d::2v:\frac{2dv}{p}=HO::v+z:\frac{d}{p}\times v+z=NB \end{array}\right\}\therefore\frac{c}{p}\times$$

$\overline{x+z}+\frac{d}{p}\times\overline{v+z}=b.\therefore cx+cz+dv+dz=pb$, or (writing b, for $c+d$) $cx+bz+dv=pb$; then *per* Property of the Curve

$$\text{we have}\left\{\begin{array}{l} x:\frac{4ccxx}{pp}::z:\frac{4ccxz}{pp}\overline{NE}^2 \\ v:\frac{4ddvv}{pp}::z:\frac{4ddvz}{pp}\overline{NF}^2 \end{array}\right\}ccx=ddv,\therefore v=$$

$\frac{cc}{dd}x$; which wrote for v, in the Expreſſion $cx+bz+dv=pb$, gives $\frac{cdx+ccx}{d}+bz=bp$, or $\frac{cb}{d}x+bz=bp$; or $\frac{c}{d}x+z=p$. But by the Queſtion, VN×NE, or $z\times\frac{2c}{p}\sqrt{zx}$; or rather, $z^3x=x\times\overline{p-\frac{c}{d}x}^3$ is a *Maximum*. In Fluxions $x\times\overline{p-\frac{c}{d}x}^3-\frac{3c}{d}\dot{x}x\times\overline{p-\frac{c}{d}x}^2=0.\therefore x=\frac{pd}{4c}$; which wrote for x in the Expreſſion $z=p-\frac{c}{d}x$, gives $z=\frac{3}{4}p.\therefore FE=2NE=\sqrt{3dc}$.

Hence it appears that the Height of the greateſt Parabola that can be inſcribed in any Triangle, will be ¾ of the Height of ſuch Triangle, and the Baſe of the ſaid Parabola will be equal to the ſquare Root of three times the Recangle of the Segments of the Triangle's Baſe. Now, if BC $\left\{\begin{matrix}75\\70\\65\end{matrix}\right\}$ then will NV $=\left\{\begin{matrix}42\\45\\48,46155\end{matrix}\right\}$ FE $=\left\{\begin{matrix}64,48256\\58,0947\\55,4565\end{matrix}\right\}$

nd the Area of the Parabola $=\left\{\begin{matrix}1805,5114\\1742,840\\1791,677\end{matrix}\right\}$ Hence it appears, that the Baſe of the Parabola muſt ſtand upon the greateſt Side of the Triangle.

The ſame anſwered by Mr. *Wm. Bevil* of *Harpſwell.*

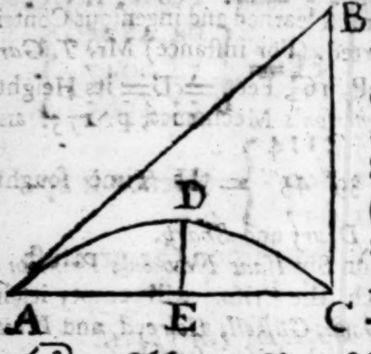
Let BA (ſee laſt Fig.) $=a$, AC$=b$, BC$=c$, AD$=d$, DC= , BD$=h$; alſo for VN the Abſciſſa put x; SG$=y$; then er ſim. Triangles $f : d :: y : \frac{dy}{f}=$MS. And by the Property f a Parabola $\frac{dy}{2f} : y^2 :: x : \frac{2fyx}{d}=$NE^2 the Sq. of the Ordinate: nd $h : f :: y : \frac{fy}{h}=$HO; again by ſim. Δs, $h : d :: \frac{fy}{h} : \frac{dfy}{h^2}$ =OV; and $\frac{fdy}{h}$ (OV) : $\frac{fy}{h}$ (HO) :: $\frac{dfy+2h^2x}{2h^2}$ (RN) : $\frac{fy+2h^2x}{2hd}=$BN. Alſo, $d : f :: \frac{dy+2fx}{2f}$ (MN) : $-\frac{dy+2fx}{2d}$ =NC. Therefore $\frac{dfy+2h^2x}{2hd}-h=f-\frac{dy-2fx}{2d}=$DN; or $=2h-\frac{2hx}{d}$; which being put for y, in $\sqrt{\frac{2fyx}{d}}\times\frac{2x}{2}$ e Area of the Parabola, and thrown into Fluxions, we have $dx^2\dot{x}-4x^3\dot{x}=0$; whence $x=\frac{3d}{4}=42$ the Abſciſſa of the arabola; and the Ordinate $=32,1277$: alſo $\frac{h}{2}=$SG, and $\frac{s}{2}$ =HO, which is *univerſal.*

Nottinghamienſis obſerves, It is evident that let the Ratio of the Segents of the Baſe of the Triangle be what it will; the Altitude of the Pabola will ſtill bear the ſame Proportion to that of the Triangle; becauſe at Ratio being conſtant, can have no Effect on the *Minimum* relating to e Perpendicular: and becauſe it is known that the greateſt Triangle that ll circumſcribe a given Curve, will be when the Subtangent is equal to lf the Altitude of the ſaid Triangle; and becauſe the Curve of a Parabola ways divides the Subtangent into two equal Parts; it is evident that the titude of the Parabola will $=\frac{3}{4}$ of that of the Triangle; and its Ordinate the ſq. Root of the Rectangle of the Segments of the Baſe.

This Queſtion was alſo truly ſolved by Meſſ. *Bamfield, Careleſs, Eneſer, ſkell, Kingſton, Spicer,* and others, whoſe Solutions we cannot publiſh want of Room.

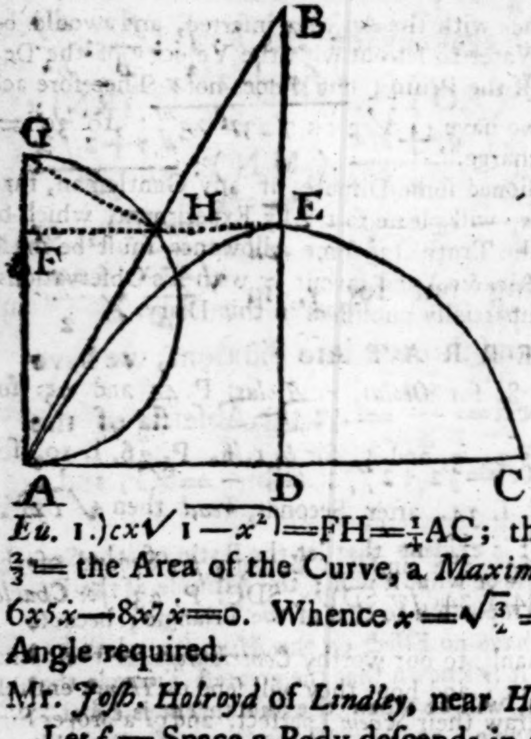
10 Queſt. (160) anſwered by Mr. *S. Bamfield* of *Honiton*, *Dev.*

Put $x =$ Sine ∠BAC, then $\sqrt{1-xx} =$ Coſ. ∠ B; $r =$ the greateſt horizontal Range, which is when the < of Elevation $= 45°$; $b =$ the correſpondent Height: *per* Laws of Projectiles ſay, $1 : (= s$: of double the ∠ of Elevation 45°) $: r :: 2x\sqrt{1-xx}$ (= S. of double the < BAC) $: 2rx\sqrt{1-xx} =$ AC. Again ſay, $1 : (=$ verſed Sine of double the < 45°) $b :: 2xx$ (= verſed Sine of double the < BAC) $: 2bxx =$ DE ∴ DE × AC is to be a *Max.* which in Fluxions is $96rrbbx^5\dot{x} - 128rrbbx^7\dot{x} = 0$; reduced $x = \sqrt{\frac{3}{4}} = ,86602 =$ Sine of 60°. *fere* = the Angle of Elevation required.



The ſame anſwered by Mr. *W. Bevil* of *Harpſwell.*

If a Body be projected with a Velocity of d Feet in a ſecond of Time, in a *non-reſiſting* Medium; and $p =$ the Feet deſcended by an heavy Body in that Time, we have $\frac{d^2}{4p} =$ AG the Height the Body would aſcend if ſhot directly upwards, for which Height put c; Alſo let $x =$ Sine BAD, the Angle of Elevation (and the Radius Unity) then *per* Trigonometry $1 : c :: x : cx =$ AH; alſo $1 : cx :: x : cx^2 =$ AF = DE; and (by 47 *Eu.* 1.) $cx\sqrt{1-x^2} =$ FH $= \frac{1}{4}$AC; therefore $4c^2x^3\sqrt{1-x^2} \times \frac{2}{3} =$ the Area of the Curve, a *Maximum*; and in Fluxions is $6x^5\dot{x} - 8x^7\dot{x} = 0$. Whence $x = \sqrt{\frac{3}{4}} = ,8660254 = 60°$, the Angle required.



Mr. *Joſh. Holroyd* of *Lindley*, near *Huddersfield*, ſolves it thus.

Let $f =$ Space a Body deſcends in a Second, $a =$ Velocity, and s and $c =$ Sine and Coſ. of the Angle of Elevation: Then by *Mechanics* $\frac{aasc}{f} =$ horizontal Diſtance; and $\frac{aass}{4f} =$ Altitude of Projection; and $\frac{2a^4s^3c}{12f^2} =$ Area of the Curve; writing

$\sqrt{1-s^2}$ for s, its $\sqrt{4a^8s^6-4a^8s^8}$) = a *Maximum*, in Fluxions is $24a^8s^5\dot{s}-32a^8s^7\dot{s}=0$. Reduced is $s=\sqrt{\frac{24}{32}}$ = Sine of 60° 0′. = the Angle required.

Observations, &c.] We received a great many different Solutions to the 7th Queſt. laſt Year, from ſome of our moſt learned and ingenious Contributors, which did not agree with thoſe inſerted. (For inſtance) Mr. *T. Garrard* putting the Solidity of the Priſm = P, $16\frac{1}{2}$ Feet $=c$D= its Height, and a = the Area of the Orifice; by *Emerſon*'s Mechanics, p. 175. and Fluxions, p. 110. gives $\frac{2P}{a\sqrt{2Dc}}=10'\ 39''\ 45'''$ = the Time ſought, which agrees with the Solutions by Meſſ. *Drury* and *Sharp*.

Mr. *Tho. Moſs* *, by a Proceſs founded on Sir *Iſaac Newton*'s *Principia*, gives 6′ 10″ 19‴ for the Time in which the Priſm will empty itſelf. Meſſ. *Bamfield*, *Charlton*, *Careleſs Jack*, *Donn*, *Gaſkell*, *Holroyd*, and *Weetman*, bring out Concluſions the very ſame with thoſe inſerted.

Mr. *Bevil* in his Letter this Year, ſays, "In my humble Opinion, there "is no true Anſwer inſerted to Queſt. 147 laſt Year. I anſwer it thus. Let "A = the Area of the Priſm's Baſe in Inches, $a=10$, its Depth, $d=1\frac{1}{2}$ $c=,7854$, $s=16\frac{1}{12}\times 12$, then $\frac{A}{d^2c}\times\sqrt{\frac{a}{s}}$ will be $=452{,}398295=7'$ "32″ 23‴. which correſponds with the Anſwers inſerted, and would be "the true Time, was the Water to ſet out with the Velocity of the De"ſcent, from the Height of the Priſm; but it does not: Therefore ac"cording to Sir *I. Newton* we have $1:\sqrt{2}::7'\ 32''\ 23''':10'\ 39''$ = "the true Time of the Diſcharge."

As this Queſtion has occaſioned ſome Diſpute, if any Gentleman, furniſhed with proper Apparatus, will pleaſe to try by Experiment, which of theſe *Theories* come neareſt the Truth (as ſome Allowance muſt be made for Friction, Preſſure of the Air, &c.) and favour us with his Obſervations, they ſhall be carefully and impartially publiſhed in this Diary.

ERRATA.

Diary 1755, P. 43. l. 8. for *Oeolus*, *r. Æolus*. P. 44 and 45. for *W. Davis* r. *D. Davis*.

Diary 1756, p. 21. Lines 2, 3, and 4, for *b*. r. 6. P. 26. l. 10. for $+\frac{8a}{27}$, r. $-\frac{8a}{27}$. P. 30. l. 34. after Seconds, *read* then $\sqrt{193}:341{,}05995::\sqrt{10}:77{,}637$ the uniform Velocity *per* Second of the Water emptying itſelf. P. 34. l. 24. *for* SDE *r.* SDC. P. 43. *for Charles* r. *Chriſtopher Maſon*.

We once more return Thanks to our worthy *Contributors* for their kind Aſſiſtance and Encouragement; and hope they will ſend us *Things* entirely new. And that they will draw their *Schemes* perfect, and of a proper *Size* for the *Diary*; alſo that they will bring all their Equations out in Numbers; and further, to ſend their Letters within the Time limited, &c. *Nottingham*, 2 *June*, 1756.

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* If Mr. *Moſs* had not made an Overſight in his Numbers, his Solution (ſo far as it is founded on the *Principia*) would have agreed exactly with laſt Year's Anſwers; the reſt of his Proceſs determines nothing.

The following Eclipſe of the Moon on *July* 30, 1757, which will be viſible if Clouds interpoſe not, ſhould have been inſerted in the proper Place, if Mr. *Tho. Allen* of *Spalding* had favoured us with his Letter in *Time*; but (tho' it bears Date the 4th of *May*) we are willing to give it a Place here; in hopes that *he*, and all the reſt of our *Contributors*, will for the future, take care to ſend their Letters, that they may come to Hand within the Time limited in the Advertiſement.

His *Calculation* is as under:

	H.	D.	Sec.
Beginning at *Spalding*, 1757, *July* the 30th —	10	8	47 P.M.
Ecliptic Oppoſition — —	11	34	25
Middle — — —	11	39	7
End — — —	13	9	27
Duration — —	3	0	40
Digits eclipſed — —	11	11	00

N.B. Mr. *Allen* has computed by Dr. *Halley's* Tables.

New MATHEMATICAL QUESTIONS *propoſed, to be anſwer'd in the next Year's* Diary.

(1) Queſtion 161 by Mr. *W. Smith* of *Irthlingborough.*

AT *Irthlingborough* in *Northamptonſhire*,
There dwells a virtuous Maid divinely fair:
With Beauty, Wit, and Eloquence ſhe's crown'd;
And ev'ry lovely Grace in her is found!
An Inſtance view *, then *Artiſts* make appear
Her Name, in your fam'd *Diary* the next Year.

* As better *Ideas* are formed by viſual Rays, than can be expreſſed by Words; we tell you, that her Chriſtian Name is ELIZABETH, and her Surname conſiſts of ſix Letters, having their Places in the Alphabet expreſſed by the Values of v, u, w, x, y, and z, in the following Equations ‡; by means whereof it may be diſcovered without any adfected Equation.

‡ $$\overline{x^2+w^2-2z^2}\big|^{\frac{5}{2}} \times \sqrt{x^2-z^2} + \overline{z+x}\big|^3 = 2829323{,}6 \textit{ fere};$$

$$\frac{x^3+z^3}{x+z} - \overline{\frac{x-z}{2}}\Big|^2 \div \sqrt{\frac{x-z}{2}} = 28{,}637 \textit{ fere}; \overline{\frac{wz-x}{2x}}\Big|^{y} - \overline{\frac{wz-x}{2x}}\Big|^{y-1} + \overline{\frac{wz-x}{2x}}\Big|^{y-5} + \overline{\frac{wz-x}{2x}}\Big|^{y-9} = 2184;$$

$$\frac{\overline{v^6u^4 - x^2v^2 - z^3v^2 + y^4v^2} \times wvu^2}{vuwxyz} = 9913\tfrac{1043}{1880}; \frac{v^6u^5w^4x^3y^2z}{vu^2w^3x^4y^5z^6} = 15\tfrac{1572791}{3400000}; x = w.$$

(2) Queſt. 162, by Mr. *John Goodhead*, of *Nottingham.*

I'm in Love with a Damſel who has ſtore of bright Gold
In *Guineas* and *Moidores*; the Sum to unfold

Was a difficult Taſk, that long puzzled my Brains,
But finding it out, I am put to more Pains:
Being now, by the fair one, requir'd to ſhew
The Number of *Guineas* and *Moidores* alſo.

Given $\left\{\begin{array}{l} xx+yy=a=23401 \\ x^1+y+y^1+x=b=124781 \end{array}\right\}$ Quere x and y with the Inveſtigation? x^x being = the Number of *Guineas*, and y^y the Number of *Moidores*.

(3) Queſt. 163, by Mr. *Cha. Maſon* of *Sapperton*, *Glouceſt.*

In the Spring Quarter, *Anno* 1756, Day broke at Three, and the *Sun's* Altitude that Morning when due Eaſt was $=32° 42'$; required, where and when this happened?

(4) Queſt. 164, by Mr. *Abr. Botham* of *Watnall*, *Nott.*

Suppoſe a Ship ſet ſail from a certain Place in Lat. 28° 30' *April* 3, 1755, at Noon, and continues her Voyage on a great Circle of the Sphere, at the uniform Motion of 4 Miles an Hour, for 667 Hours, at which Time they perceive the Sun juſt riſing: *Quere* the Lat. ſhe arrived at, 60 Miles being a Degree?

(5) Queſt. 165, by Mr. *John Goodhead*, Jun. of *Nottingham*.

A Gentleman having a Quantity of old faſhioned Silver, is deſirous to convert the leaſt Part of it poſſible into a *Punch Bowl*, in form of a Solid generated by the Revolution of the ſemicubical Parabola, to contain exactly four Pints; the Thickneſs of the Metal, to be $\frac{1}{12}$ of an Inch: *Quere* the Dimenſions of the *Bowl*, and Quantity of Silver to make it? Alſo ſuppoſing the ſaid *Bowl* to be filled with *Punch*, it is further required to find, at how many Glaſſes three modern *Mathematicians* may empty it: The Glaſs being in the Form of the Fruſtum of a Cone; whoſe leſs Diameter is x, the greater xx; Altitude $x^{\frac{3x}{2}}$; and Solidity x^{x^x} Inches?

(6) Queſt. 166, by Mr. *Tho. Allen*, of *Spalding*, *Linc.*

Given, $a\dot{y}^2-\frac{y\dot{y}^3}{\dot{x}}-y^2\dot{y}^2-ay\ddot{y}=0$. It is propoſed to find x, in Terms of y aſcending, independent of reverting any Series?

(7) Queſtion 167, by Mr. *Charles Wildbore* of *Nottingham*.

Allowing the *Sun* to revolve about its Axis in 25 Days, 6 Hours; *Venus* (according to *Signior Bianchini*) in 24 Days, 8 Hours; the *Earth* in 23 Hours, 56 Min. the *Moon* in 27 Days, 7 Hours, 43 Min. *Mars* in one Day 40 Min. and *Jupiter* in 9 Hours, 56 Min. It is required to determine the *Ratio's* of their greateſt and leaſt Diameters?

(8) Queſtion 168, by Mr. *Tho. Garrard* of *Ipſwich*.

Suppoſe a Ciſtern in the Shape of a Parallelopipedon, has one ſupplying Cock, which alone would fill it in 10 Minutes: and three evacuating Cocks; the firſt of which would empty it alone in 60 Minutes, the ſecond in 80 Minutes, and the third in 120 Min. *Quere* in what Time would this Ciſtern be filled, if all the Cocks were ſet open together, by a general Theorem?

(9) Queſt. 169, propoſed by Mr. *Cha. Wildbore* of *Nottingham*.

In a certain Street in *Nottingham* there are three Lamps fixed (*viz.*) two A and B on one Side, and a third Lamp C, on the other: Now a Perſon being to paſs along the ſaid Street, is deſirous to know the *Nature* and *Length* of the Track he muſt deſcribe, ſo that he may be the leaſt ſubject to be diſcerned: when the Diſtances AB, BC, and CA, are given =34, 40, and 42 reſpectively: the Lamps A, B, and C, caſting Light in the Proportion of 4, 5, and 6?

(10) Queſtion 170, propoſed by *Tabularius*.

Suppoſe a perfectly flexible Chain, 20 Inches long, to ſlide freely over two Pins, fixed in a Line parallel to the Horizon, ſo that the Curve formed thereby may reſt in Equilibrio, with the Ends thereof hanging perpendicular from the Pins: it is propoſed to determine the Lengths of the Curve and horizontal Line, when the given Chain is the ſhorteſt that will hang at Liberty over the Pins; and alſo the Lengths of the two Curves which may be formed by the Chain, when the Pins are 7 Inches from each other?

(11) Queſtion 171, by Mr. *Tho. Moſs* of *London*.

A lays 3 *Guineas* to 2 with B, that he throws, with three common Dice, a greater Number of Points at 4 Throws (or Trials only) than B can throw Heads, at 7 Throws, with 10 Halfpence; and with this Reſtriction too, that if one Ace (or more than one) ſhould happen to come up in any of the ſaid Throws, none of the Points ariſing at ſuch Throw (or Throws) ſhall be reckoned to A's Number. Now A's firſt Throw produced the three Duces, and in B's firſt Toſs came up 7 Heads; the former then deſires his Antagoniſt (B) to draw the Wager: To find the Probability which B has of winning, and what he may expect to receive of A. to comply with his Requeſt.

N. B. *This ſhould have been publiſhed laſt Year, but came too late, dated* 7 *May.*

(12) Queſt. 172, by Mr. *Charles Wildbore* of *Nottingham*.

A *French* Man of War, ſpying an *Engliſh* Frigate at a Diſtance, bore down upon it, and coming within half a Mile, ſaluted it with her chaſe Guns; which the *Engliſh* then, making all the Sail they were able, returned with broad Sides: in this Manner they bore away, with an uniform Celerity; (the Velocity of the *Engliſh* being to that of the *French* as 5 to 4) always keeping at the ſame Diſtance from each other, till the *French* were 10 Miles from the Place where the Chaſe began, when the *Engliſh* ſteer'd away, and the *French*, deſpairing to come up with them, gave over the Chaſe. Now it was obſerved that the *French* Ship deſcribed a ſemi-parabolic Curve, whoſe Abſciſſa is 8 Miles: it is required from hence to determine the *Nature* and *Length* of the Track deſcribed by the *Engliſh*?

(13) Queſtion 173, by Mr. *Tho. Allen*.

Given $a^2\dot{x}^2 = y\dot{y}\dot{x} - x\dot{y}^2 + c\dot{y}^2$; to find the correct Equation of the Fluents by the *direct Method* of Fluxions only.

Anſwers to the ÆNIGMAS, in the laſt Year's *Diary*.

1. The Letter G.
2. MAGGOT IN A NUT.
3. A FIRE-SCREEN.
4. REASON.
5. ENVY.
6. A STROLLING PLAYER.
7. A LOUSE.
8. SOPHISTRY.

Anſwers to the NOSE-GAY.

1. *Sun-flower*, 2. *Honey-ſuckle*, 3. *Carnation*, 4. *Snow-drop*, 5. *Sweet-William*, 6. *Tube-roſe*, 7. *Blue-bottle*, 8. *Jeſſemine*, 9. *Narciſſus*, 10. *Star of Bethlehem*, 11. *Tulip*, 12. *Iris*, 13. *Globethiſtle*, 14. *Crown imperial*, 15. *Lark-ſpur*, 16. *Hearts-eaſe*, 17. *Wall-flower*, 18. *Cow-ſlip*, 19. *Pheaſants-eye*, 20. *Mary-gold*, 21. *Violet*.

All the Ænigma's anſwered in Verſe, by Mr. *L. Charlton*.

BRITONS! no more, while G**** illuſtrious reigns, 1.
Let STROLLERS with *French* MAGGOTS fill your Brains: 6. 2.
That haughty Crew with SOPHISTRY wou'd blind 8.
The Powers of REASON, and corrupt the Mind! 4.
Such VERMIN * may the *Gauls* for ever SCREEN; 7. 3.
While ENVY'd *Britain* is of Iſles the Queen! 5.

* Alluding to a Louſe.

An Anſwer to all the *Ænigmas*, humbly inſcribed to the *fair* but *inexorable* CÆLIA; by Mr. *S. Bamfield* of *Honiton, Dev.*

CÆLIA! Thou glorious but inconſtant Maid,
Why am I ſcorn'd!—Why ruin'd and betray'd?
What, REASON's Charmer! Is't decreed above, 4.
That I muſt ENVY'd be by her I love? 5.

Trod like a WORM beneath thy preſſing Feet! 2.
Yet ſcarce complain, and fearfully ſubmit.
How have I SCREEN'd thy beauteous Face from *Sun*; 3.
What kind and humble Offices I've done!
The Times we've STROLL'd, and PLAY'd, and joined Hands 6.
In Hopes at length to join in *Hymen's* Bands.
But Hopes are vaniſh'd—O thou cruel Fair!
Lo! USE thy utmoſt Wrath, I'll not deſpair: 7.
I'll CHEAT * the World, but I'll admitted be, 8.
And will once more enjoy thy Company:
Then, if thou wilt perſiſt thy Swain to hate,
I'll publiſh all thy Faults—thou moſt in GRATE! 1.
Will mock thy Pow'r, and ſcorn the haughty *Maid*
Laugh at her Folly, and at all ſhe's ſaid.
Oh! No, thou conquer'ſt ſtill my yielding Heart;
Thy bright Idea never can depart!
Oh charming matchleſs CÆLIA!—ſmile once more:
My all—my Soul is thine!—I thee adore!
If thou ſtill frown—I'll ſeek th' oblivious Grave,
And pleaſe myſelf, I dy'd thy wounded Slave.

* Alluding to *Sophiſtry*.

Mr. *Cha. Underwood* of *Bath*, ſolves all the *Ænigmas* and NOSE-GAY, as follows; in Remembrance of a pleaſant Walk in a *Gentleman's* * GARDEN. (*N. B.* The Noſe-gay only is *Italick*) * I.

Within this ſilent Wilderneſs,
What *Sunflowers* here abound! 1.
Here little Birds fly to their Neſts;
And *Violets* deck the Ground. 21.
See! how the Spring, ſo gradually
Enlivens all our Shades:
When Froſt, and *Snow-drops* from it fly, 4.
Cow-ſlips adorn the Meads. 18.
The *Iris*, and the *Jeſſemine*; 12. 8.
Carnation and *Tube-Roſe*, 3. 6.
While NUT-trees, *Tulips*, and the Vine, II. 11.
And *Wall-flowers* greet your Noſe. 17
The *Lark-ſpur*, and the *Mary-gold*, 15. 20.
And *Star of Bethl'em* high; 10.
With *Crown Imperial* glorious Mold, 14.
Illumes the *Pheaſants-Eye*. 19.
Sweet-Williams and the *Honey-ſuckle*, 5. 2.
And Scotland's *Thiſtle-Ball*; 13.
The *Narciſſus* and *Blue-Bottle*: 9.7.
Are Love's and *Hearts-eaſe* all. 16.
See how theſe Plants by Nature join,
To yield us Pleaſure here:
No Hate nor ENVY they deſign, V.
But flouriſh without Fear.
But, ah! the Man that ſpends his Days
In trifling by the FIRE *; III.
Whoſe chief Delight's in Balls and PLAYS, VI.
Nor REASON does admire, IV.
He's like the Man that builds his Houſe,
SOPHISTER like on Sand VIII.
Whoſe Fortitude is (like a LOUSE) VII.
Deſtroy'd by th' weakeſt Hand.

* *Alluding to the Fire-ſcreen.*

All

All the Ænigmas anſwered in a new *Ænigma* propoſed for next Year (1) Ænig. 115, by *Random Junior*.

Of Children *ten* born at one Birth
But *one* reſembles me,
Nor are two Creatures on the Earth
More intimate than *we*:
Yet ſuch my Lot that when *this* Brother
Takes *one* Side, *I* muſt take the *other*.
For ENVY I have REASON none, 5.4.
Unleſs *this* may be Matter;
That of *ten* Brethren only *one*
Is low as me in Stature.
A Nameſake formerly I had,
Well known to Young and Old;
And many a merry Prank he play'd,
Which often has been told.
He STROLL'd about, made famous Sport, 6.
As Hiſt'ry does determine;
And often was employ'd at Court,
Whilſt *I* was killinG VERMINE.*. 1.7.
He was indeed a buſy Whelp,
I am not uſeleſs quite;
The Hungry I to Food do help,
And SOPHISTER to write. 8.
More has been ſaid than need have been,
To indicate my Name:
Now *crack* the NUT, take off the SCREEN; 2.3.
And tell me who I am.

* Alluding to a *Louſe*.

All the *Ænigmas* anſwered by *Tho. Peat*, in an Elegy occaſioned by the Death of the late worthy and ingenious Mr. *John Badder*; who for ſixteen Years paſt was a *Proprietor* in this *Diary*. He died at *Coſſall* near *Nottingham*, on *Sunday*, *Feb*. 22, 1756.

Ah, *Gent's*—He's dead! come mourn, lament with me,
There's REASON good—ſure Greater cannot be! 4. 1.
Badder to WORMS and Duſt, is now a Prey! 2.
Oh! SCREEN his hallow'd *Tomb* from Feet prophane! 3.
Nor let a STROLLING PLAYER, nor the Vain, 6.
With ENVY, SOPHISTRY, and LOUSY Cant; 5. 8. 7.
Nor carping *Momus* know; how much I want
Of his great *Genius*, *Knowledge*, *Parts*, *Aſſiſtance*;
(But, to that awful *Call* there's no Reſiſtance!)
Oh! may I, whilſt I here abide inherit
His, as *Eliſha* did *Elijah's* Spirit.

All the *Ænigmas* anſwer'd by Mr. *Cha. Wildbore* of *Nottingham*.

Death's ſure and common, both to Small and Great; 1.
We are but PLAYERS in our preſent State. 6.
But, in the happy Regions above,
There's nothing found but Harmony and Love!
O'er thoſe bleſs'd Plains, thy Shade, O BADDER, roves,
By cryſtal Rills, and ever blooming Groves:
There thou may'ſt muſe, and ſpend thy happy Hours,
With REASON juſt, in *Amaranthine* Bow'rs! 4.
Where never-dying Birds for ever ſing,
And Flowers do bloom in an eternal Spring;

There Joy and Happineſs attend the Bleſs'd
Here, SOPHISTRY, and LOUSE-like ENVY reſt; 8. 7. 5.
And nought but Cares and MAGGOTS fill our Brain, 2.
To SCREEN ourſelves from Poverty and Pain: 3.
Then why ſo fond of Life! Why ſhou'd Mankind,
Prefer to Happineſs, this World of Wind?

N. B. *The Queſtion concerning the* Oak *and* Ivy *(ſent us by a Gentleman whom we ſhould be very ſorry to diſoblige) would have juſtly merited a Place: But as we find it was publiſhed in the* Ladies Diary, 1737, *and anſwered in the ſame, in* 1738, *by Mr.* Lycet, *the Propoſer, and by Mr.* Emerſon, *we chuſe to omit it.*

New Ænigmas to be anſwer'd in the next *Year's Diary.*

(2) Ænig. 116, by Mr. *Tim. Drury* of *Great Houghton, Yorkſh.*

WITH Brutes of various Kinds, and *Men* I'm ſeen,
But ſeldom I have with the *Ladies* been;
For if rude Nature e'er it ſo ordain,
Then I do quickly meet your high Diſdain.
In ancient Times how greatly was I bleſs'd!
I was by *Patriarchs* and *Kings* careſs'd:
Honours (almoſt divine) were to me paid,
And Men of all Degrees implor'd my Aid;
Then, to my Name ſome Rev'rence was allow'd:
And I with *Quantum ſufficit* endow'd:
But now alas! I bear but ſmall Eſteem,
My former Grandeur's thought an idle Dream;
I'm cut and mangled, and oft-times am made
To ſtand the Rage of many a ſturdy Blade:
Howe'er, this Comfort there is ſtill for me
Not Time, nor Place can quite demoliſh *Me*;
In ſpite of ev'ry Scoundrel's Diſgrace,
Altho' they do accuſe me to my Face;
Yet, I their Taunts and Subtilties deſpiſe,
For (Palm-tree like) depreſs'd, the more I riſe.

(3) Ænigma 117, by Mr. *J. Noorthouck* of *Watford.*

I, of *ten* Brethren, all well known, am not the leaſt eſteem'd;
Tho' *one* we ſcarely chuſe to own, as he is *ſpurious* deem'd.
In *Ages* dark, when *Augury*, *Magic* and *Divination*
The *Craft of Knaves* was own'd by Fools, I got great Reputation;
Scarce any Trick was then perform'd, by Rogues of *Underſtanding*,
To *awe* and *fleece* a ſlaviſh Herd, but what I had a *Hand* in.
And where their Relicks ſtill ſurvive, I ſtill maintain my Bounds;
I have an Hand in Ague Charms, and eke in Coffee Grounds.
Propitious I am always thought, by ev'ry Nurſe and Maid,
Since Witches, Fairies, Imps, and Sprites, are by my Power laid.

Thus much for Folly; now proceed to Things acknowledg'd true,
And firſt, all pious godly Men have chiefly *me* in View!
The Pope, who no Superior owns, brimful of prieſtly Pride;
Forgets that I in all his Pomp, on him triumphant ride.
When two Companions o'er a Pot, for Converſation meet;
Without my Help their Mirth will not be lively nor compleat!
In Trade and Science I excel; for much depends on *me*;
As now it does on you to tell my Name, and what I be.

(4) Ænigma 118, by Mr. *Cha. Underwood* of *Bath*.

I, from a noble Senſe derive, thro' Care and Tribulation;
But, being never known to thrive, muſt ſuffer Deſtination.
No Hand or Feet have I at all, yet am no ſooner born,
But run on till I have a Fall, and then am left forlorn!
With Laughter I ſometimes am ſeen (tho' to each other ſtrange)
And ſometimes in the Play-houſe am, yet like the Scenes I change.
I own my Time is here but ſhort; yet they that ſowe in me;
Shall never be forſaken for't, but ever bleſs'd ſhall be!

(5) Ænigma 119, by Mr. *John Haycoſt*.

A Thing more ſtrange, I think you'll ſay,
Moſt People never knew,
A Thing of ſo much uſe as I;
And leſs than nothing too.
Yet at my Name, ſome break their Hearts,
And others do run mad:
I'm worſe to ſome than fiery Darts,
Whilſt others I make glad.
I frequent am in moſt Diſcourſe,
In Truth and Lying too;
In Work and Play, both Night and Day,
But chiefly when you woo.
In ſeeking what I am, no doubt,
You'll often hear me nam'd,
And if by chance you find me out
You're worthy to be fam'd.
" So ſeek and find me if you can,
" What is my Name, and who I am.

(6) Ænigma 120, by *Random Junior*.

Ere I arrive at State mature,
I various Tortures muſt endure;
Am cut, bound, beaten and confin'd,
And made the Sport of every Wind!
Yet, tho' with Patience theſe I bear,
Am doom'd to Pains ſtill more ſevere;
Which I, by Turns, am made to feel,
By Fire, and Water, and the Wheel;
Am ſcalded *bitterly*! And then
Scourg'd until I *foam* again;
Unable to bear more! What wonder
If Body now and Spirit ſunder?
The groſſer Part returns to clay,
To Birds, to Beaſts, and Fiſh a Prey;
The Spirit, e'er its perfect Glory
A while confin'd in Purgatory;
But, after due *Purgation*, when
My Liberty, I get again,
A full Revenge to me belongs
To compenſate my former Wrongs;
For, I ſhall ſurely be to the Man
That makes too free with me a Demon.
But, thoſe who uſe me well ſhall find
In me a cheerful Friend and kind.
I'm to the Crown a Friend moſt hearty
Tho' equally I ſerve each Party;
And tho' I ſeldom ſtir from Home,
Yet, at Elections out I come;
Into the publick Streets I venture,
Of all the Mob myſelf the Centre!
Headed by me, as one who is Chief
They perpetrate all Kind of Miſchief.
My Riddle in two Points is wrong,
'Tis much too eaſy, and too long.

(7) Ænigma 121, by Mr. *Cha. Wildbore*.

In dormant Non-exiſtence had I ſlept
It had been better for the Sons of Men!

In geometric Form, with checquer'd Pavements,
A ſtately Dome on the Outſide I ſeem;
But, when I ope my Portals, and diſplay
Unto Mankind my *Inſide*, ſtraight appear
Two Armies blended: but they ſoon aſſume
Each one his Poſt, in regular Array.
Plac'd in two open *Forums* which are parted
Much like the Sons of *Europe* and of *Afric*.
Yet, they the Peſt of Learning may be call'd,
Th'Army of Fiends, and Jubilee of Hell!
Theſe plac'd; then there deſcends like Clap of Thunder
The two *Catchpoles* of the infernal Regions!
Two ſpotted Demons—Gods of Atheiſm,
And wait the Fate of thoſe embattled Armies,
As *Scipio* (of old) and *Hannibal* in *Afric*
Did weigh the Fate of ancient *Rome* and *Carthage*,
So by them *Sharpers* weigh the Fate of Fools!
Within my Bowels (in myſelf) I'm harmleſs,
Nor Miſchief do without the Aid of Man.
Then, Sons of Folly, of my Wiles beware;
For Friendſhip I can quickly turn to Hatred,
And Affluence to pining Poverty.
And now I hope (ſo very plain 'tis wrote)
You need not twice be aſk'd what is my Name.

(8) Ænigma 122, by *A grey Mongrel Cur.*

Of all Things I'm moſt priz'd, but moſt abus'd;
Am ſometimes ſhort, and oft (when long) ill us'd:
But, be that as it will, I'm ſtill approv'd,
Deſir'd, and much eſteem'd: by all belov'd!
The *King*, the *Boor*, the ſage *Philoſopher*,
Nay even *Brutes* 'bove all Things me prefer:
For me all Hazards run, and for my Sake,
Will venture their whole All, if 't lies at Stake!
Yet notwithſtanding, what I've ſaid is true,
Numberleſs Enemies do me purſue;
In various Shapes and in unknown Diſguiſe
Diſſembling; and ſometimes to the Surprize
Of all By-ſtanders, I am ſnatch'd away,
From thoſe who fondeſt were of me---Then ſay,
What am I?——Who have *ev'ry one* my Friend,
And yet one Enemy will be my End!
End, did I ſay! Yes---ſure as you're a Man,
You like, you love me---keep me if you can.

(9) Ænigma 123, by Mr. *James Hall.*

'Tis true I am no Scholar, Sages,
Nor am I read in claſſic Pages,

Yet oft am ſeen in grave Diſguiſe,
With *Egypt's* Fogs before my Eyes,
Soothing the Fates unwelcome Bliſter,
The happy Event of a Teſter.
I'm Contradiction quite all o'er,
Stoic as well as *Epicure*;
I'm green as Graſs near cryſtal Streams,
White as the Swans on ſilver *Thames*;
Yellow as Wax, and yet you'll own,
I'm always dreſt in Ruſſet brown.
I'm hard and rough, yet ſmooth and fair,
Soft as the Furrs of *Ruſſian* Bear;
Sweet as the Honey-ſweet, inviting,
Charming, pleaſant, rich, delighting;
And yet, moſt nauſeous and untoothſome,
Diſtaſteful, bitter, harſh, and loathſome.
This well ſets forth the Scene of Life;
What, Three to One! (unequal Strife)
Three Hardſhips! See to Honour's Prize,
The Way thro' rugged Virtue lies.
My Fate's more ſtrange (you'll ſcarce believe)
Firſt ſtript! next rackt! then flea'd alive!
What Tortures! biting! pinching! ſtoning!
'Tis well if I eſcape from drowning!
Laſt ſuffer *Jonah's* Fate—d'ye hear it?
Pity me, ſince for you I bear it:
Not out of Hate, but juſt to prove
The mere Extremity of Love.
Excuſe me, Sages, now for Shame,
There's nothing wanting but—my Name.

(10) Ænigma 124, by Mr. *John Pickburn.*

When the vaſt Fabrick of the Heav'ns was made,
The Skies unfurl'd and Earth's Foundation laid,
In Nature's earlieſt Age I took my Birth,
And ſpread my Empire round the ſpacious Earth,
The Beaſts, and Birds, and Fiſh that cleave the Sea
Confeſs my regal Pow'r, and all obey;
And tho' Mankind ſometimes with me contends,
Few are my Foes while Thouſands are my Friends.
Nor is it ſtrange, ſince human Beings are,
The conſtant Objects of my friendly Care.
I'm the Procurer of Content and Peace,
Poſſeſt of me a Man may live at Eaſe;
May bear with Patience all the broken Vows,
And the Miſconduct of a wanton Spouſe.

By my Aſſiſtance Lawyers gain their End,
Nor can the Parſon boaſt a better Friend.
I often in judicial Courts appear,
And ſave whom awful Juſtice would not ſpare;
I find Employment too amongſt the Great,
In divers Matters which concern the State;
When Generals take the Field in Honour's Cauſe,
And hazard Life, in ſearch of vain Applauſe;
While Thouſands fall by ſlaught'ring Sword and Gun,
Oft by my Aid the Battle's loſt or won.
Thus have I, thro' the Courſe of all my Days,
Befriended Man a thouſand different Ways;
Giv'n Wealth and Eaſe to ſome, to others Fame,
Then in Return be pleas'd to tell my Name;
Which, by theſe obvious Hints, you'll quickly find,
For, right or wrong, you bear me in your Mind.

An *Alphabetical Catalogue* of Contributors to this *Diary*;

The Fig. 1, 2, 3, &c. ſhewing the Queſtions, the Numerical Letters i, ii, &c. the Ænig. and N. the Noſegay of Flowers each anſwered.

MR Tho. Allen 1ſt Letter with Solutions &c. never came to Hand, but we received two others with 2 Q. prop. and the Ecl. Mr Rich. Abbot all Æ. but v. viii. Mr Anth. Arch all Æ. and N. Angelica all Æ. Mr Ab. Botham 3, 5, 7, 8, 10. i, iii, iv, v, vii. N. prop. 1 Q. Mr Sam. Bamfield all Q. all Æ. in Ver. Mr Wm Bevil 1, 5, 6, 8, 9, 10. Mr John Boſton 5, 10. i, iv, vii. Miſs Bridget all Æ. Mr Joſ. Briſcall 1, 5, 10. all Æ. N. Mr Bright all Æ. Mr Lionel Charlton all Q. but 4. all Æ. in Ver. N. and Mr Cooks Q. Mr T. Corbit i, v, vii. N. prop. N. Jack Careleſs 8, 9, 10, Ecl. Mr Tim. Drury 5, 6, 7. i, iv, v, vi, vii. prop. 1 Q. and 1 Æ. Mr Luke Elſtob i, vii. prop. 1 Q. 1 P. Ecl. &c. Mr Wm. Eneſer all but 1 and 6. Miſs Enfield all Æ. Mr Tho. Fletcher 3, all but ii, vi, and viii. Fructuarius N. prop. a Deſert after the ſame Manner as the N. laſt Year. Mr Tho. Garrard all Q. prop. 2 Q. Mr Zach. Gaſkell all Q. Mr Edw. Greenſted Ecl. Mr Tho. Grimes 2, 4. i, ii, vii. Mr John Goodhead Jun. prop. 2 Q. Mr Tho. Hare 3, 5, 10. i, ii, iv, vi, vii. Mr Joſhua Holroyd 3, 4, 5, 7, 8, 10. i, iv, v, vii. Mr Jacob Hill all Q. Mr Kingſton all Q. all Æ. N. prop. 1 Q. Mr Rob. Marſh all Æ. but iii, & viii. N. in Ver. F. F. Mingle i, ii, iv, v, vii. prop. 1 Æ. Mr Cha. Maſon 3, 5, 6, 8. prop. 1 Q. Mongrel Cur P. 1 Æ. Mr J. Noorthouck all but vi, viii. N. prop. 1 Æ. Mr Tho. Peat all Æ. in V. Mr Geo. Rebus all Æ. but 3. prop. 1 Q. Mr Alex. Row prop. 2 Q. 1 Æ. Random Junior all Æ. prop. 2 Æ. Mr Geo. Salmon i, iii, iv, v, vii. Miſs Sophia prop. 2 Q. 1 Æ. all modeſtly taken from our own Sup. &c. Mr Wm Smith 5, 10. i, ii, iii, iv, vii. N. prop. 1 Q. Harmon Sanctus 2, 4, 5. Mr Wm Spicer 3, 5, 6, 7, 8, 9. prop. 1 Q. Mr Wm Swift ii, iv, v, vi, vii. prop 1 Æ. 1 P. N. Tabularius 1, 3, 5, 6, 7, 8, 9, 10. prop. 1 Q. Mr John Thompſon 5, 6, 8. prop. 1 Q. Mr Cha. Underwood all but iv and viii. in V. prop. 1 Æ. N. in V. Mr Cha. Wildbore all Q. all Æ. N. Mr H. Weetman 2, 7. Wiſeacre all Æ. N. prop. N.

FINIS.